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**Intermountain
Forest and Range
Experiment Station
Ogden, UT 84401**

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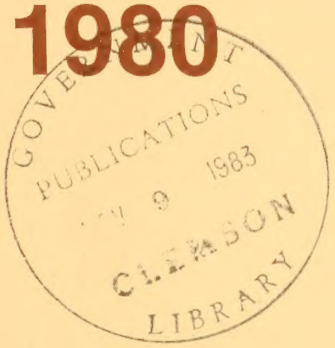
Forest Area and Timber Resource Statistics for State and Private Lands in New Mexico, 1980

Dorothy G Felt
Velma J. Sterrett



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RESEARCH SUMMARY

The State of New Mexico contains 1,254,958 acres of commercial timberland in State and private ownership. These acres support more than 1.1 billion cubic feet of growing stock and 4.1 billion board feet of sawtimber. Additional information on total land area, commercial timberland area, timber inventory, and net annual growth and mortality based on Forest Survey standards is presented.

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INTRODUCTION

This resource bulletin presents the principal findings of the second Statewide inventory of State and private lands in New Mexico. The first inventory, conducted in 1962, did not sample counties intensively nor were the findings reported at a county or working circle level. Fieldwork for the second cycle, conducted by personnel from the New Mexico Division of State Forestry and the Forest Survey Research Work Unit at the Intermountain Forest and Range Experiment Station in Ogden, Utah, began in 1970 and was completed in 1980 (fig. 1). To allow for meaningful comparisons the data for those working circles inventoried early in the cycle were updated to 1980. Thus, the information reported here will differ from totals obtained by adding the statistics contained in the individual working circle reports.

The primary objective of Forest Survey, a continuing nationwide undertaking conducted by the Forest Service, U.S. Department of Agriculture, is to provide an assessment of the renewable resource situation for forest and range lands of the Nation. Fundamental to the accomplishment of this objective are the periodic State-by-State resource inventories. Originally, Forest Survey was

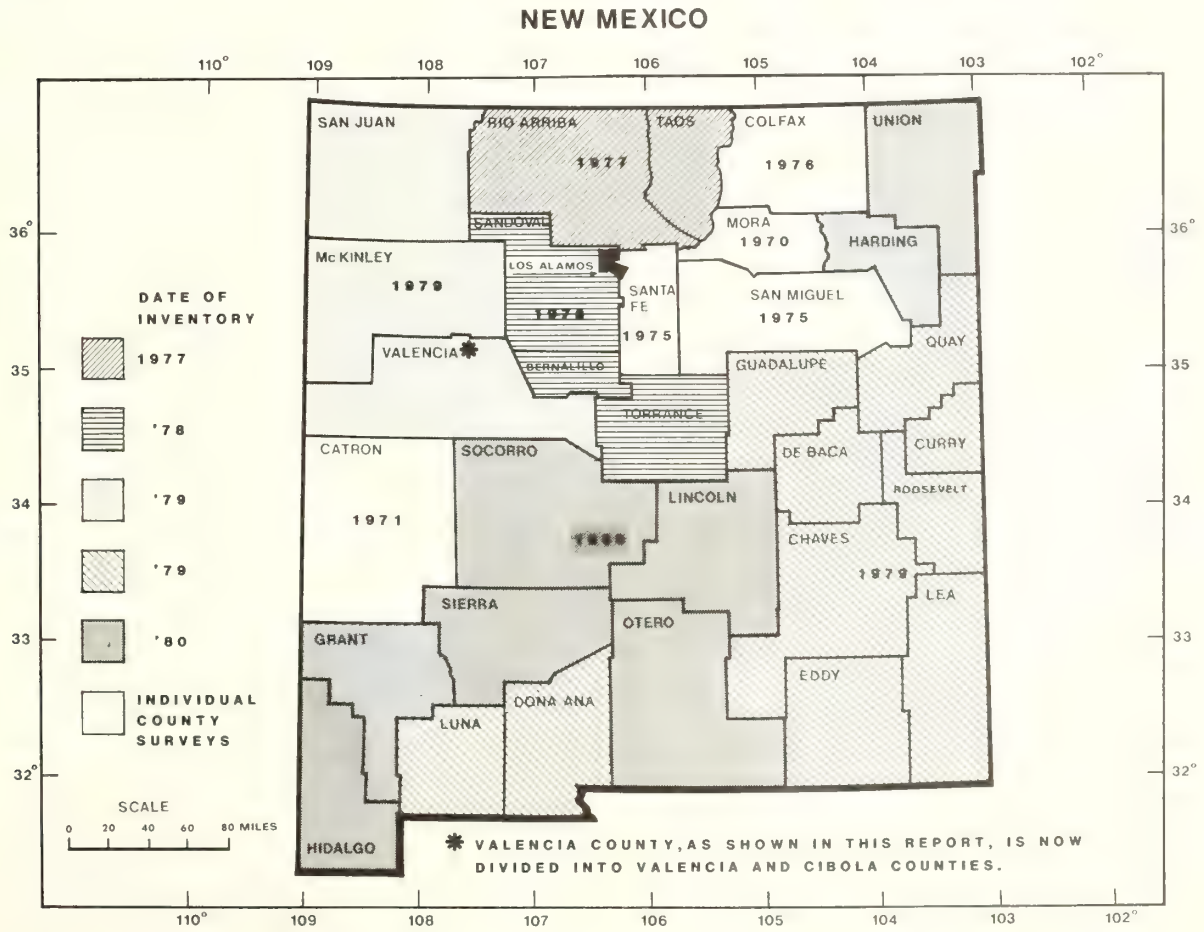

Figure 1.—Date of inventory by working circle, New Mexico.

authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

The resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, Wyoming, western South Dakota, west Texas, and Oklahoma's Panhandle are administered by the Intermountain Forest and Range Experiment Station with headquarters in Ogden, Utah. These inventories provide information on the extent and condition of State and privately owned forest lands, volume of timber, and rates of timber growth and mortality. These data, when combined with similar information on Federal lands, provide a basis for the formulation of forest policies and programs and for the orderly development and use of the resources.

HIGHLIGHTS

Area

- The forest land area is 6,998,934 acres or 15 percent of the total State and private land area in New Mexico (fig. 2).
- Of the forest land, 1,254,958 acres, almost 18 percent, is classified as commercial timberland.
- Private ownership accounts for 1,161,972 acres, over 92 percent of the commercial timberland.
- Ponderosa pine, Douglas-fir, fir-spruce, and aspen are the predominant forest types and occupy 91 percent of the commercial timberland (fig. 3).
- Over 71 percent of the commercial timberland is in the 20 to 49 cubic foot productivity class, and 92 percent of this is privately owned.

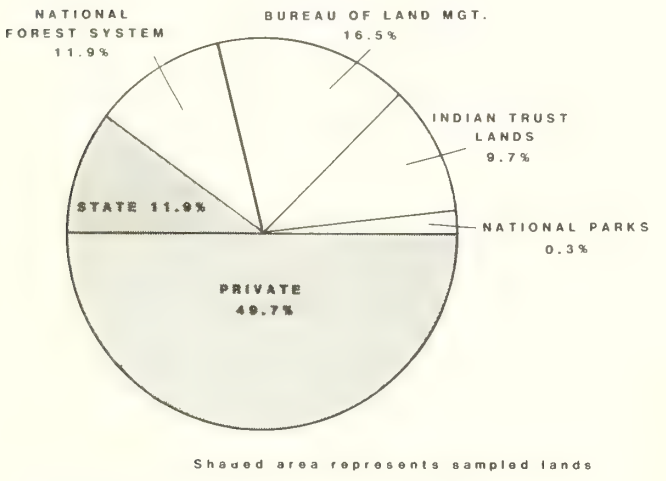

Figure 2.—Percent of total land area in New Mexico by ownership, 1980. (In this publication the private ownership category includes farmer-owned and other private ownerships, a small acreage of county and municipal ownerships and approximately 2.6 million acres of miscellaneous Federal ownership.)

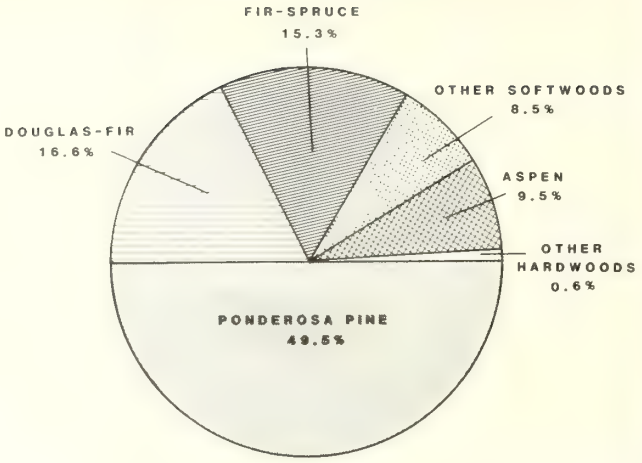

Figure 3.—Percent of commercial timberland in New Mexico by forest type, 1980.

Inventory

- Growing stock amounts to more than 1.1 billion cubic feet and sawtimber volume totals 4.1 billion board feet. In this report all reference to sawtimber volume is in International ¼-inch rule.
- Ponderosa pine is the predominate species on 50 percent of the commercial timberland (fig. 3).
- Rough, rotten, and salvable dead trees comprise over 101 million cubic feet, 8 percent of the total sound wood volume.
- More than two-thirds of the growing stock volume is in ponderosa pine, Engelmann spruce, and Douglas-fir (fig. 4).
- Private owners control 93 percent of both the total growing stock and sawtimber volume.

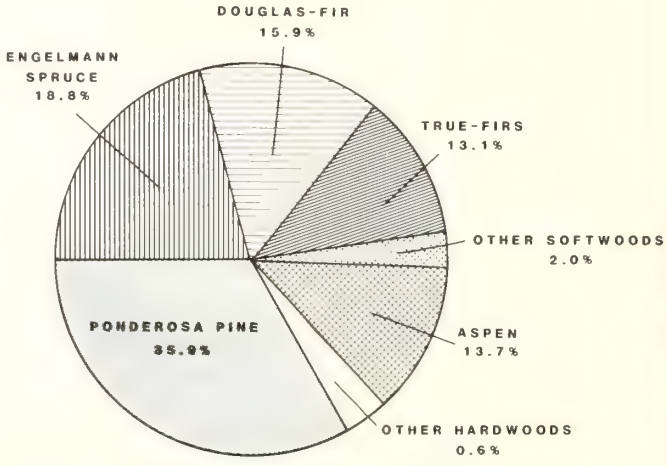

Figure 4.—Percent of sound live tree volume in New Mexico by species, 1980.

Growth and Mortality

- Net annual growth of growing stock totals 27.9 million cubic feet and 118.2 million board feet.
- About 94 percent of the total net growth is on private lands.
- The annual mortality of 1.9 million cubic feet offsets 6 percent of the gross annual growth.

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics primarily at the State and working circle levels. Procedures were:

1. Initial area estimates were based on the classification of 336,171 sample points systematically placed on the latest aerial photographs available. The sample points were summarized and grouped into strata for subsequent field sampling. The photo points, adjusted to meet known land areas, were used to compute area expansion factors for the field stratum means.

2. Land classification and estimates of timber characteristics and volume were based on observations and measurements recorded at 1,709 ground sample locations of which 1,427 were forested. Sample trees were selected using a 10-point cluster, which includes fixed plots (1/300 acre) for trees less than 5.0 inches diameter at breast height (d.b.h.) and variable plots (40 basal area factor) for trees 5.0 inches d.b.h. or larger.

3. Equations prepared from detailed measurements collected on trees throughout the Southwest were used to compute the volume and defect of individual tally trees.

4. All photo and field data were sent to Ogden, Utah, for editing and were punched onto cards and stored for machine computing, sorting, and tabulation. Final estimates were based on statistical summaries of the data.

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on very small sample sizes, and so result in high sampling errors. The standard error percents shown in tables 1 and 2 were calculated at the 67 percent confidence level.

Table 1.--Area of State and private forest land in New Mexico by type group, with percent standard error, 1980

Item	Softwood type	Hardwood type	All types	Percent standard error
		Acres		
Commercial timberland	1,127,304	127,654	1,254,958	±2.7
Productive reserved	438	790	1,228	
Other forest land:				
Unproductive reserved	37,906	4,885	42,791	
Unproductive nonreserved	5,120,828	579,129	5,699,957	

Table 2.--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on State and private commercial timberland in New Mexico by softwoods and hardwoods, with percent standard error

Item	Softwoods	Hardwoods	All species	Percent standard error
		Volume		
Net volume, 1980				
Growing stock (M cubic feet)	986,309	164,958	1,151,267	±6.1
Sawtimber (M board feet[1])	3,807,205	334,754	4,141,959	±4.5
Net annual growth, 1979				
Growing stock (M cubic feet)	23,473	4,476	27,949	±4.4
Sawtimber (M board feet[1])	105,039	13,204	118,243	±5.8
Annual mortality, 1979				
Growing stock (M cubic feet)	1,570	294	1,864	±19.6
Sawtimber (M board feet[1])	5,963	658	6,621	±21.5

[1]International 1/4-inch rule.

TERMINOLOGY

The following section contains definitions that are relevant to the timber resource data presented in this resource bulletin.

Land

Area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains; streams, sloughs, estuaries, and canals less than 120 feet in width; and lakes, reservoirs, and ponds less than 1 acre in size.

Water

Streams, sloughs, estuaries, and canals more than 120 feet in width; and lakes, reservoirs, and ponds more than 1 acre in size.

Land Use Classes

Forest land.—Land at least 10.0 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use.

Commercial timberland.—Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. (Areas qualifying have the capability of producing in excess of 20 cubic feet per acre per year of industrial wood in natural stands. Currently inaccessible and inoperable areas are included.)

Productive-reserved forest land.—Forest land sufficiently productive to qualify as commercial timberland, but withdrawn from timber utilization through statute, administrative designation, or exclusive use for Christmas tree production.

Other forest land.—Forest land incapable of producing 20 cubic feet per acre per year of industrial wood in natural stands because of adverse site conditions; includes both reserved and nonreserved forest land.

Nonforest land.—Land that has never supported forests and lands formerly forested where use for timber management is precluded by development for other uses.

Public Ownership Classes

National Forest lands.—Federal lands legally designated as National Forest or purchase units and other lands under the administration of the Forest Service, including experimental areas and Bankhead-Jones Title III lands.

Bureau of Land Management lands.—Federal lands administered by the Bureau of Land Management.

Miscellaneous Federal lands.—Federal lands other than (1) National Forest lands; (2) lands administered by the Bureau of Land Management; and (3) Indian trust lands.

Indian trust lands.—Indian lands held in trust by the Federal Government, for Indian tribal groups or for individual allotments.

State lands.—Lands owned by State or lands leased to the State for 50 years or more.

County and municipal lands.—Lands owned by counties and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

Private Ownership Classes

Forest industry lands.—Lands owned by companies or by individuals operating wood-processing plants.

Farmer-owned lands.—Lands owned by farm operators. These exclude lands leased by farm operators from such nonfarm owners as railroad companies and States.

Other private lands.—Privately owned lands other than forest industry and farmer-owned lands.

Forest Type and Tree Species

Forest types.—A classification of forest land based upon the species forming a plurality of live-tree stocking.

Forest trees.—Woody plants having a well-developed stem and usually more than 12 feet in height at maturity.

Commercial species.—Tree species presently or prospectively suitable for industrial wood products.

Softwoods.—Monocotyledonous trees, usually evergreen having needles or scalelike leaves.

Hardwoods.—Dicotyledonous trees, usually broad-leaved and deciduous.

Area Condition Classes

Stocking.—Stocking is an expression of the extent to which growing space is effectively utilized by present or potential growing stock trees of commercial species. "Percent of stocking" is synonymous with "percentage of growing space occupied" and means the ratio of actual stocking to full stocking for comparable sites and stands. Basal area is used as a basis for measuring stocking.

"Stocking percentages" express current area occupancy in relation to specified standards for full stocking based on number, size, and spacing of trees considered necessary to fully utilize the forest land.

Full utilization of the site is assumed to occur over a range of basal area. As an interim guide, 60 percent of normal yield table values has been used to establish the lower limit of this range, which represents full-site occupancy, and equals 100-percent stocking. The upper limit of full stocking has been set at 132 percent.

Class 10.—Areas fully stocked (100 to 132 percent) with desirable trees and not overstocked (133 percent or more).

Class 20.—Areas fully stocked with desirable trees, but overstocked with all live trees.

Class 30.—Areas medium to fully stocked (60 to 99 percent) with desirable trees and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Class 40.—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and/or conditions that ordinarily prevent occupancy by desirable trees.

Class 50.—Areas poorly stocked (16.7 to 59 percent) with desirable trees, but fully stocked with growing stock trees.

Class 60.—Areas poorly stocked with desirable trees, but with medium to full stocking of growing stock trees.

Class 70.—Areas nonstocked (less than 16.7 percent) or poorly stocked with desirable trees, and poorly stocked with growing stock trees.

Class 80.—Low-risk old-growth stands.

Class 90.—High-risk old-growth stands.

Nonstocked.—Areas less than 16.7 percent stocked with growing stock trees.

Productivity

Productivity class.—A classification of forest land in terms of potential growth in cubic feet of fully stocked natural stands.

Stand-Size Classes

Sawtimber stands.—Stands at least 16.7 percent stocked with growing stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber stands.—Stands at least 16.7 percent stocked with growing stock trees in which half or more of this stocking is in poletimber and/or sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

Sapling-seedling stands.—Stands at least 16.7 percent stocked with growing stock trees in which more than half of the stocking is saplings and/or seedlings.

Nonstocked land.—Commercial timberland less than 16.7 percent stocked with growing stock trees.

Class of Timber

Growing stock trees.—Live trees of commercial species qualifying as desirable or acceptable trees. (Excludes rough, rotten, and dead trees.)

Desirable trees.—Growing stock trees (1) having no serious defect in quality to limit present or prospective use for timber products; (2) of relatively high vigor; and (3) containing no pathogens that may result in death or serious deterioration before rotation age.

Acceptable trees.—Growing stock trees meeting specified standards of size and quality, but not qualifying as desirable trees.

Rough trees.—(1) Live trees that do not contain at least one 12-foot saw log or two noncontiguous saw logs, each 8 feet or longer, now or prospectively, and/or do not meet Rocky Mountain regional specifications for freedom from defect primarily because of roughness or poor form; and (2) all live trees of noncommercial species.

Rotten trees.—Live trees that do not contain at least one 12-foot saw log or two noncontiguous saw logs, each 8 feet or longer, now or prospectively, and/or do not meet Rocky Mountain regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume (cubic-foot basis) in a tree is rotten.

Salvable dead trees.—Standing or down dead trees that are considered merchantable by Rocky Mountain regional standards.

Saw-log portion.—That part of the bole of sawtimber trees between the stump and the saw-log top. A 1-foot stump is used.

Upper-stem portion.—That part of the bole of sawtimber trees above the saw-log top to a minimum top diameter of 4.0 inches outside bark or to the point where the central stem breaks into limbs, whichever occurs first.

Tree-Size Classes

Seedlings.—Live trees less than 1.0 inch d.b.h.

Saplings.—Trees 1.0 to 4.9 inches d.b.h.

Poletimber trees.—Trees at least 5.0 inches d.b.h., but smaller than sawtimber size.

Sawtimber trees.—Trees exceeding poletimber size. In the Intermountain States, the minimum d.b.h. for softwood sawtimber is 9.0 inches and for hardwoods 11.0 inches.

Volume

Cull volume.—Portions of a tree's volume that are not usable for industrial wood products because of rot, poor form, or other defect.

Net volume.—Gross volume less deductions for cull.

Growing stock volume.—Net volume in cubic feet of live sawtimber trees and live poletimber trees from stump to a minimum 4.0-inch top (of central stem) outside bark. Net volume equals gross volume less deduction for rot and missing bole sections.

Sawtimber volume.—Net volume in board feet of sawtimber trees of commercial species. Net volume equals gross volume less deduction for rot, sweep, crook, and other defects that affect use for lumber.

Growth and Mortality

Net annual growth.—The increase in net growing stock or sawtimber volume of a specified size class for a specific year. (Components of net annual growth include the increment in net volume of trees at the beginning of the specific year surviving to its end, plus the net volume of trees reaching the size class during the year, minus the net volume of trees that died during the year, minus the net volume of trees that became rough or rotten trees during the year.)

Mortality.—Number or sound-wood volume of growing stock trees dying from natural causes during a specified period, usually annually.

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Table 3.--Total land and water area in New Mexico by ownership class, 1980

Ownership class	Area
	- - - Acres - - -
Land:	
National Forest[1]	9,230,765
Bureau of Land Management	12,836,240
National Park[2]	246,800
Indian trust lands	7,507,267
State	9,223,939
Private[3]	38,609,357
Total land area	77,654,368
Census water	164,851
Total land and water[4]	77,819,219

[1]Includes National Grasslands administered by the Forest Service.

[2]Not included with miscellaneous Federal ownership, a category of private, for purposes of clarity.

[3]On this and all following tables, the private ownership category includes farmer-owned and other private ownerships, a small acreage of county and municipal ownership, and approximately 2.6 million acres of miscellaneous Federal ownership. Also includes the recent transfer of 100,000 acres of private land to the National Forest System (Valle Vidal-Carson National Forest).

[4]U.S. Bureau of the Census, land and water area of the United States, 1980.

Table 4.--Total land area of State and private ownership in New Mexico by major land class and ownership class, 1980

Land class	Ownership class		Total
	State	Private	
	- - - - - - - - - - - - Acres - - - - - - - - - - - -		
Commercial timberland	92,986	1,161,972	1,254,958
Productive reserved forest land	688	540	1,228
Other forest land:			
Unproductive reserved	11,785	31,006	42,791
Unproductive nonreserved	1,026,173	4,673,784	5,699,957
Total forest land	1,131,632	5,867,302	6,998,934
Nonforest land	8,092,307	32,742,055	40,834,362
Total land area	9,223,939	38,609,357	47,833,296

Table 5.--Area of State and private commercial timberland in New Mexico by forest type, stand-size class, and productivity class, 1980

Forest type and stand-size class	Productivity class				Total acres
	120+	85-119	50-84	20-49	
	- - - - - - - - - - - - - - - - Acres - - - - - - - - - - - - - - - -				
Douglas-fir:					
Sawtimber	--	5,177	39,094	87,217	131,488
Poletimber	--	--	10,051	37,529	47,580
Sapling and seedling	--	--	3,125	23,285	26,410
Nonstocked	--	--	--	1,971	1,971
Total	--	5,177	52,270	150,002	207,449
Ponderosa pine:					
Sawtimber	--	2,801	76,296	396,979	476,076
Poletimber	--	--	10,238	75,631	85,869
Sapling and seedling	--	--	2,283	13,710	15,993
Nonstocked	--	--	--	43,210	43,210
Total	--	2,801	88,817	529,530	621,148
Southwestern white pine:					
Sawtimber	--	--	670	--	670
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	670	--	670
Spruce-subalpine fir:					
Sawtimber	--	5,575	55,947	40,839	102,361
Poletimber	--	--	10,327	9,644	19,971
Sapling and seedling	--	1,806	--	9,877	11,683
Nonstocked	--	--	--	--	--
Total	--	7,381	66,274	60,360	134,015
Limber pine:					
Sawtimber	2,643	--	1,155	--	3,798
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	2,643	--	1,155	--	3,798
White fir:					
Sawtimber	--	4,676	23,376	15,904	43,956
Poletimber	--	--	644	--	644
Sapling and seedling	--	--	--	3,510	3,510
Nonstocked	--	--	613	1,970	2,583
Total	--	4,676	24,633	21,384	50,693

(con.)

Table 5. (con.)

Forest type and stand-size class	Productivity class				Total acres
	120+	85-119	50-84	20-49	
	- - - - - - - - - - - - - - - - Acres - - - - - - - - - - - - - - - -				
Engelmann spruce:					
Sawtimber	--	7,167	10,341	10,031	27,539
Poletimber	--	670	4,713	15,482	20,865
Sapling and seedling	--	--	7,217	1,929	9,146
Nonstocked	--	--	--	662	662
Total	--	7,837	22,271	28,104	58,212
Pinyon-juniper:					
Sawtimber	--	--	123	22,193	22,316
Poletimber	--	--	--	10,353	10,353
Sapling and seedling	--	--	--	9,396	9,396
Nonstocked	--	--	--	9,254	9,254
Total	--	--	123	51,196	51,319
Aspen:					
Sawtimber	--	2,824	40,401	13,119	56,344
Poletimber	611	5,509	8,878	8,515	23,513
Sapling and seedling	--	--	9,666	30,143	39,809
Nonstocked	--	--	--	--	--
Total	611	8,333	58,945	51,777	119,666
Cottonwood:					
Sawtimber	--	1,631	--	2,982	4,613
Poletimber	--	--	1,882	729	2,611
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	661	661
Total	--	1,631	1,882	4,372	7,885
Mixed hardwoods:					
Sawtimber	--	--	--	103	103
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	103	103
All types:					
Sawtimber	2,643	29,851	247,403	589,367	869,264
Poletimber	611	6,179	46,733	157,883	211,406
Sapling and seedling	--	1,806	22,291	91,850	115,947
Nonstocked	--	--	613	57,728	58,341
Total	3,254	37,836	317,040	896,828	1,254,958

Table 6.--Area of State-owned commercial timberland in New Mexico by forest type, stand-size class, and productivity class, 1980

Forest type and stand-size class	Productivity class				Total acres
	120+	85-119	50-84	20-49	
	Acres				
Douglas-fir:					
Sawtimber	--	55	2,059	3,840	5,954
Poletimber	--	--	1,398	4,642	6,040
Sapling and seedling	--	--	261	3,159	3,420
Nonstocked	--	--	--	235	235
Total	--	55	3,718	11,876	15,649
Ponderosa pine:					
Sawtimber	--	307	4,922	29,718	34,947
Poletimber	--	--	687	5,931	6,618
Sapling and seedling	--	--	19	1,058	1,077
Nonstocked	--	--	--	3,411	3,411
Total	--	307	5,628	40,118	46,053
Southwestern white pine:					
Sawtimber	--	--	6	--	6
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	6	-	6
Spruce-subalpine fir:					
Sawtimber	--	117	2,210	1,430	3,757
Poletimber	--	--	339	1,362	1,701
Sapling and seedling	--	91	--	659	750
Nonstocked	--	--	--	--	--
Total	--	208	2,549	3,451	6,208
Limber pine:					
Sawtimber	25	--	42	--	67
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	25	--	42	--	67
White fir:					
Sawtimber	--	65	1,390	1,627	3,082
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	654	654
Nonstocked	--	--	--	234	234
Total	--	65	1,390	2,515	3,970

(con.)

Table 6. (con.)

Forest type and stand-size class	Productivity class				Total acres
	120+	85-119	50-84	20-49	
	Acres				
Engelmann spruce:					
Sawtimber	--	1,295	1,311	2,259	4,865
Poletimber	--	5	140	2,661	2,806
Sapling and seedling	--	--	1,301	17	1,318
Nonstocked	--	--	--	7	7
Total	--	1,300	2,752	4,944	8,996
Pinyon-juniper:					
Sawtimber	--	--	--	854	854
Poletimber	--	--	--	276	276
Sapling and seedling	--	--	--	1,093	1,093
Nonstocked	--	--	--	263	263
Total	--	--	--	2,486	2,486
Aspen:					
Sawtimber	--	92	2,560	427	3,079
Poletimber	--	196	1,251	411	1,858
Sapling and seedling	--	--	831	3,413	4,244
Nonstocked	--	--	--	--	--
Total	--	288	4,642	4,251	9,181
Cottonwood:					
Sawtimber	--	110	--	123	233
Poletimber	--	--	94	37	131
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	6	6
Total	--	110	94	166	370
Mixed hardwoods:					
Sawtimber	--	--	--	--	--
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	--	--
All types:					
Sawtimber	25	2,041	14,500	40,278	56,844
Poletimber	--	201	3,909	15,320	19,430
Sapling and seedling	--	91	2,412	10,053	12,556
Nonstocked	--	--	--	4,156	4,156
Total	25	2,333	20,821	69,807	92,986

Table 7.--Area of privately owned commercial timberland in New Mexico by forest type, stand-size class, and productivity class, 1980

Forest type and stand-size class	Productivity class				Total acres
	120+	85-119	50-84	20-49	
	Acres				
Douglas-fir:					
Sawtimber	--	5,122	37,035	83,377	125,534
Poletimber	--	--	8,653	32,887	41,540
Sapling and seedling	--	--	2,864	20,126	22,990
Nonstocked	--	--	--	1,736	1,736
Total	--	5,122	48,552	138,126	191,800
Ponderosa pine:					
Sawtimber	--	2,494	71,374	367,261	441,129
Poletimber	--	--	9,551	69,700	79,251
Sapling and seedling	--	--	2,264	12,652	14,916
Nonstocked	--	--	--	39,799	39,799
Total	--	2,494	83,189	489,412	575,095
Southwestern white pine:					
Sawtimber	--	--	664	--	664
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	664	--	664
Spruce-subalpine fir:					
Sawtimber	--	5,458	53,737	39,409	98,604
Poletimber	--	--	9,988	8,282	18,270
Sapling and seedling	--	1,715	--	9,218	10,933
Nonstocked	--	--	--	--	--
Total	--	7,173	63,725	56,909	127,807
Limber pine:					
Sawtimber	2,618	--	1,113	--	3,731
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	2,618	--	1,113	--	3,731
White fir:					
Sawtimber	--	4,611	21,986	14,277	40,874
Poletimber	--	--	644	--	644
Sapling and seedling	--	--	--	2,856	2,856
Nonstocked	--	--	613	1,736	2,349
Total	--	4,611	23,243	18,869	46,723

(con.)

Table 7 (con.)

Forest type and stand-size class	Productivity class				Total acres
	120+	85-119	50-84	20-49	
	Acres				
Engelmann spruce:					
Sawtimber	--	5,872	9,030	7,772	22,674
Poletimber	--	665	4,573	12,821	18,059
Sapling and seedling	--	--	5,916	1,912	7,828
Nonstocked	--	--	--	655	655
Total	--	6,537	19,519	23,160	49,216
Pinyon-juniper:					
Sawtimber	--	--	123	21,339	21,462
Poletimber	--	--	--	10,077	10,077
Sapling and seedling	--	--	--	8,303	8,303
Nonstocked	--	--	--	8,991	8,991
Total	--	--	123	48,710	48,833
Aspen:					
Sawtimber	--	2,732	37,841	12,692	53,265
Poletimber	611	5,313	7,627	8,104	21,655
Sapling and seedling	--	--	8,835	26,730	35,565
Nonstocked	--	--	--	--	--
Total	611	8,045	54,303	47,526	110,485
Cottonwood:					
Sawtimber	--	1,521	--	2,859	4,380
Poletimber	--	--	1,788	692	2,480
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	655	655
Total	--	1,521	1,788	4,206	7,515
Mixed hardwoods:					
Sawtimber	--	--	--	103	103
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	103	103
All types:					
Sawtimber	2,618	27,810	232,903	549,089	812,420
Poletimber	611	5,978	42,824	142,563	191,976
Sapling and seedling	--	1,715	19,879	81,797	103,391
Nonstocked	--	--	613	53,572	54,185
Total	3,229	35,503	296,219	827,021	1,161,972

Table 8.--Area of State and private commercial timberland in New Mexico by stand volume and ownership class, 1980

Stand volume per acre[1]	Ownership class		
	State	Private	State and private
	- - - - - - - - - - - Acres - - - - - - - - - - -		
Less than 1,500 board feet	37,250	425,555	462,805
1,500 to 4,999 board feet	44,033	521,686	565,719
5,000 to 9,999 board feet	10,933	180,535	191,468
10,000 board feet or more	770	34,196	34,966
All classes	92,986	1,161,972	1,254,958

[1]International 1/4-inch rule.

Table 9.--Area of State and private commercial timberland in New Mexico by forest type and area condition class, 1980

Forest type	Area condition class										All classes
	10	20	30	40	50	60	70	80	90	Nonstocked	
	Acres										
Douglas-fir	--	4,042	57,800	11,758	15,277	38,133	46,714	16,357	15,397	1,971	207,449
Ponderosa pine	--	--	8,809	6,998	35,965	179,998	252,682	32,934	60,552	43,210	621,148
Southwestern white pine	--	--	--	--	--	--	670	--	--	--	670
Spruce-subalpine fir	3,822	6,576	28,643	22,776	1,820	25,132	27,880	15,561	1,805	--	134,015
Limber pine	--	--	--	--	3,798	--	--	--	--	--	3,798
White fir	--	--	4,664	4,895	13,200	11,655	11,113	644	1,939	2,583	50,693
Engelmann spruce	--	--	19,696	2,466	1,282	24,083	2,259	538	7,226	662	58,212
Pinyon-juniper	--	--	--	--	--	11,085	21,040	--	9,940	9,254	51,319
Total softwoods	3,822	10,618	119,612	48,893	71,342	290,086	362,358	66,034	96,859	57,680	1,127,304
Aspen	2,163	13,888	16,769	4,987	22,325	33,629	19,512	--	6,393	--	119,666
Cottonwood	--	--	--	--	--	--	6,815	--	409	661	7,885
Mixed hardwoods	--	--	--	--	--	--	103	--	--	--	103
Total hardwoods	2,163	13,888	16,769	4,987	22,325	33,629	26,430	--	6,802	661	127,654
All types	5,985	24,506	136,381	53,880	93,667	323,715	388,788	66,034	103,661	58,341	1,254,958

Table 10.--Area of State and private productive reserved and other forest land in New Mexico by land class, ownership class, and forest type, 1980

Land class	Forest type										
	Douglas-fir	Ponderosa pine	Bristlecone pine	Subalpine fir	Limber pine	Spruce-fir	White fir	Engelmann spruce	Pinyon-juniper	Mixed softwoods	Total softwoods
	Acres										
Productive reserved area:											
State	13	158	--	--	--	5	--	--	33	40	249
Private	--	189	--	--	--	--	--	--	--	--	189
Total	13	347	--	--	--	5	--	--	33	40	438
Other forest land area:											
Unproductive reserved:											
State	--	4	--	--	--	--	--	--	5,402	1,611	7,017
Private	--	--	--	--	--	--	--	--	25,120	5,769	30,889
Total	--	4	--	--	--	--	--	--	30,522	7,380	37,906
Unproductive nonreserved:											
State	773	8,307	--	335	271	--	6	287	831,702	93,116	934,797
Private	12,954	78,450	104	9,129	3,819	--	665	4,338	3,266,355	810,217	4,186,031
Total	13,727	86,757	104	9,464	4,090	--	671	4,625	4,098,057	903,333	5,120,828
Total all areas:											
State	786	8,469	--	335	271	5	6	287	837,137	94,767	942,063
Private	12,954	78,639	104	9,129	3,819	--	665	4,338	3,291,475	815,986	4,217,109
Total acres	13,740	87,108	104	9,464	4,090	5	671	4,625	4,128,612	910,753	5,159,172

(con.)

Table 10 (con.)

Land class	Forest type					
	Oak	Aspen	Cottonwood	Mixed hardwoods	Total hardwoods	All types
	Acres					
Productive reserved area:						
State	--	--	--	439	439	688
Private	--	351	--	--	351	540
Total	--	351	--	439	790	1,228
Other forest land area:						
Unproductive reserved:						
State	1,734	--	--	3,034	4,768	11,785
Private	--	--	--	117	117	31,006
Total	1,734	--	--	3,151	4,885	42,791
Unproductive nonreserved:						
State	--	4,197	385	86,794	91,376	1,026,173
Private	--	29,538	7,346	450,869	487,753	4,673,784
Total	--	33,735	7,731	537,663	579,129	5,699,957
Total all areas:						
State	1,734	4,197	385	90,267	96,583	1,038,646
Private	--	29,889	7,346	450,986	488,221	4,705,330
Total acres	1,734	34,086	7,731	541,253	584,804	5,743,976

Table 11.--Number of growing stock trees on State and private commercial timberland in New Mexico by species and diameter class, 1980

Species	Diameter class (inches at breast height)															All classes
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand trees															
Douglas-fir	21,618	12,781	8,275	6,183	3,975	2,103	1,416	586	418	177	172	97	57	23	48	57,929
Ponderosa pine	20,867	25,385	19,305	16,046	9,348	6,535	3,909	1,922	1,045	513	334	207	50	40	53	105,559
Southwestern white pine	204	106	124	56	30	18	24	14	10	7	3	--	1	1	([1])	598
Limber pine	1,713	1,556	703	524	246	155	35	50	31	19	7	4	1	--	--	5,044
Subalpine fir	11,552	7,813	4,532	1,668	1,173	622	276	123	91	39	27	8	2	3	2	27,931
White fir	27,325	7,427	3,887	2,642	1,673	1,243	622	361	257	99	78	38	30	13	25	45,720
Engelmann spruce	20,154	18,908	8,753	6,072	5,035	2,435	1,265	738	361	112	91	47	24	19	8	64,022
Pinyon/juniper	3,216	6,606	2,771	1,639	382	220	106	102	28	--	3	--	4	--	--	15,077
Total softwoods	106,649	80,582	48,350	34,830	21,862	13,331	7,653	3,896	2,241	966	715	401	169	99	136	321,880
Aspen	26,270	22,402	10,106	6,666	3,147	1,346	738	308	102	24	7	3	1	--	--	71,120
Cottonwood	60	354	102	295	106	7	--	33	27	6	8	7	4	1	1	1,011
Other hardwoods	153	260	33	113	19	--	2	--	--	3	3	--	--	--	--	586
Total hardwoods	26,483	23,016	10,241	7,074	3,272	1,353	740	341	129	33	18	10	5	1	1	72,717
All species	133,132	103,598	58,591	41,904	25,134	14,684	8,393	4,237	2,370	999	733	411	174	100	137	394,597

[1]Less than 500 trees.

Table 12.--Number of cull and salvable dead trees on State and private commercial timberland in New Mexico by ownership class, and softwoods and hardwoods, 1980

Ownership class and species group	Cull trees			Salvable dead trees
	Sound	Rotten	Total	
	- - - - - - - - - - Thousand trees - - - - - - - - - -			
State:				
Softwoods	6,729	145	6,874	399
Hardwoods	901	374	1,275	156
Total	7,630	519	8,149	555
Private:				
Softwoods	54,626	2,278	56,904	3,764
Hardwoods	9,045	7,129	16,174	1,651
Total	63,671	9,407	73,078	5,415
State and private:				
Softwoods	61,355	2,423	63,778	4,163
Hardwoods	9,946	7,503	17,449	1,807
Total	71,301	9,926	81,227	5,970

Table 13.--Net volume of growing stock on State and private commercial timberland in New Mexico by ownership class, forest type, and stand-size class, 1980

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked	
		Thousand cubic feet				
State:						
	Douglas-fir	6,177	3,502	1,022	46	10,747
	Ponderosa pine	26,159	3,385	106	607	30,257
	Southwestern white pine	6	--	--	--	6
	Spruce-subalpine fir	7,113	1,822	233	--	9,168
	Limber pine	134	--	--	--	134
	White fir	3,322	--	191	50	3,563
	Engelmann spruce	6,491	3,487	959	([1])	10,937
	Pinyon-juniper	208	64	69	13	354
	Aspen	4,059	4,638	958	--	9,655
	Cottonwood	289	101	--	2	392
	Mixed hardwoods	--	--	--	--	--
	All types	53,958	16,999	3,538	718	75,213
Private:						
	Douglas-fir	175,938	31,558	7,652	343	215,491
	Ponderosa pine	332,085	40,658	2,708	6,609	382,060
	Southwestern white pine	735	--	--	--	735
	Spruce-subalpine fir	162,138	20,829	3,161	--	186,128
	Limber pine	8,549	--	--	--	8,549
	White fir	53,021	526	835	624	55,006
	Engelmann spruce	35,224	22,831	5,313	58	63,426
	Pinyon-juniper	6,119	2,417	741	452	9,729
	Aspen	97,834	40,189	9,612	--	147,635
	Cottonwood	5,165	1,921	--	189	7,275
	Mixed hardwoods	20	--	--	--	20
	All types	876,828	160,929	30,022	8,275	1,076,054
State and private:						
	Douglas-fir	182,115	35,060	8,674	389	226,238
	Ponderosa pine	358,244	44,043	2,814	7,216	412,317
	Southwestern white pine	741	--	--	--	741
	Spruce-subalpine fir	169,251	22,651	3,394	--	195,296
	Limber pine	8,683	--	--	--	8,683
	White fir	56,343	526	1,026	674	58,569
	Engelmann spruce	41,715	26,318	6,272	58	74,363
	Pinyon-juniper	6,327	2,481	810	465	10,083
	Aspen	101,893	44,827	10,570	--	157,290
	Cottonwood	5,454	2,022	--	191	7,667
	Mixed hardwoods	20	--	--	--	20
	All types	930,786	177,928	33,560	8,993	1,151,267

[1]Less than 0.5 thousand cubic feet.

Table 14.--Net volume of sawtimber on State and private commercial timberland in New Mexico by ownership class, forest type, and stand-size class, 1980

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked	
		Thousand board feet[1]				
State:						
	Douglas-fir	23,990	6,475	2,796	203	33,464
	Ponderosa pine	108,634	8,377	389	3,050	120,450
	Southwestern white pine	27	--	--	--	27
	Spruce-subalpine fir	28,120	2,085	879	--	31,084
	Limber pine	414	--	--	--	414
	White fir	12,917	--	528	215	13,660
	Engelmann spruce	24,773	7,505	3,388	3	35,669
	Pinyon-juniper	762	253	169	65	1,249
	Aspen	13,381	4,948	1,672	--	20,001
	Cottonwood	1,380	34	--	10	1,424
	Mixed hardwoods	--	--	--	--	--
	All types	214,398	29,677	9,821	3,546	257,442
Private:						
	Douglas-fir	735,383	61,208	24,563	1,500	822,654
	Ponderosa pine	1,350,213	88,736	10,237	33,552	1,482,738
	Southwestern white pine	3,279	--	--	--	3,279
	Spruce-subalpine fir	622,863	30,385	11,129	--	664,377
	Limber pine	20,853	--	--	--	20,853
	White fir	192,617	1,012	2,305	2,671	198,605
	Engelmann spruce	141,217	47,470	18,110	304	207,101
	Pinyon-juniper	21,009	9,923	2,582	2,305	35,819
	Aspen	342,356	55,813	24,044	--	422,213
	Cottonwood	25,142	642	--	1,020	26,804
	Mixed hardwoods	74	--	--	--	74
	All types	3,455,006	295,189	92,970	41,352	3,884,517
State and private:						
	Douglas-fir	759,373	67,683	27,359	1,703	856,118
	Ponderosa pine	1,458,847	97,113	10,626	36,602	1,603,188
	Southwestern white pine	3,306	--	--	--	3,306
	Spruce-subalpine fir	650,983	32,470	12,008	--	695,461
	Limber pine	21,267	--	--	--	21,267
	White fir	205,534	1,012	2,833	2,886	212,265
	Engelmann spruce	165,990	54,975	21,498	307	242,770
	Pinyon-juniper	21,771	10,176	2,751	2,370	37,068
	Aspen	355,737	60,761	25,716	--	442,214
	Cottonwood	26,522	676	--	1,030	28,228
	Mixed hardwoods	74	--	--	--	74
	All types	3,669,404	324,866	102,791	44,898	4,141,959

[1]International 1/4-inch rule.

Table 15.--Net volume of growing stock on State and private commercial timberland in New Mexico by species and diameter class, 1980

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand cubic feet													
Douglas-fir	12,799	23,619	28,632	26,292	24,684	15,238	13,127	8,086	9,482	6,822	4,516	2,246	7,608	183,151
Ponderosa pine	22,661	52,723	59,202	69,359	62,843	43,993	33,283	22,054	17,888	13,723	4,198	3,683	7,594	413,204
Southwestern white pine	315	262	252	251	498	435	363	289	135	--	80	63	36	2,979
Limber pine	1,476	1,972	1,831	1,764	781	1,083	966	712	268	191	70	--	--	11,114
Subalpine fir	8,581	8,256	11,592	9,699	6,115	3,689	3,161	1,904	1,487	602	273	229	253	55,841
White fir	7,106	12,768	13,283	15,546	11,251	9,167	7,840	4,234	4,138	2,548	2,266	1,268	3,814	95,229
Engelmann spruce	16,994	29,564	45,669	36,528	28,189	23,276	14,425	6,083	6,054	3,709	2,201	1,968	1,318	215,978
Pinyon/juniper	1,407	2,520	1,349	958	1,058	1,134	254	--	79	--	54	--	--	8,813
Total softwoods	71,339	131,684	161,810	160,397	135,419	98,015	73,419	43,362	39,531	27,595	13,658	9,457	20,623	986,309
Aspen	23,808	42,464	35,020	23,203	17,772	9,637	4,287	1,227	348	166	53	--	--	157,985
Cottonwood	275	1,283	974	70	--	1,058	1,223	206	444	382	293	42	151	6,401
Other hardwoods	26	343	119	--	37	--	--	23	24	--	--	--	--	572
Total hardwoods	24,109	44,090	36,113	23,273	17,809	10,695	5,510	1,456	816	548	346	42	151	164,958
All species	95,448	175,774	197,923	183,670	153,228	108,710	78,929	44,818	40,347	28,143	14,004	9,499	20,774	1,151,267

Table 16.--Net volume of sawtimber on State and private commercial timberland in New Mexico by species and diameter class, 1980

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International 1/4-inch rule											
Douglas-fir	101,351	127,886	132,990	85,593	77,270	48,959	57,957	41,052	27,179	13,552	45,926	759,715
Ponderosa pine	188,966	309,241	317,759	241,143	190,094	128,893	103,407	82,040	24,882	21,848	45,722	1,653,995
Southwestern white pine	865	1,092	2,368	2,197	1,876	1,525	727	--	455	363	214	11,682
Limber pine	7,568	7,571	4,262	5,916	5,058	3,945	1,448	1,072	403	--	--	37,243
Subalpine fir	46,290	48,366	31,893	19,354	16,540	9,946	7,816	3,198	1,464	1,245	1,401	187,513
White fir	47,239	67,810	51,297	42,187	35,239	18,383	17,109	10,521	9,884	5,134	15,487	320,290
Engelmann spruce	178,027	182,837	147,781	123,038	76,050	31,976	31,872	19,659	11,748	10,616	7,176	820,780
Pinyon/juniper	4,432	3,434	3,546	3,465	735	--	222	--	153	--	--	15,987
Total softwoods	574,738	748,237	691,896	522,893	402,862	243,627	220,558	157,542	76,168	52,758	115,926	3,807,205
Aspen	XXXXX	124,823	100,669	55,180	23,696	6,819	1,660	886	286	--	--	314,019
Cottonwood	XXXXX	335	--	6,048	6,841	1,013	2,054	1,684	1,428	197	702	20,302
Other hardwoods	XXXXX	--	206	--	--	129	98	--	--	--	--	433
Total hardwoods	XXXXX	125,158	100,875	61,228	30,537	7,961	3,812	2,570	1,714	197	702	334,754
All species	574,738	873,395	792,771	584,121	433,399	251,588	224,370	160,112	77,882	52,955	116,628	4,141,959

Table 17.--Net volume of growing stock and sawtimber on State and private commercial timberland in New Mexico by ownership class and species, 1980

Ownership class	Species													All species
	Douglas-fir	Ponderosa pine	Southwestern white pine	Limber pine	Subalpine fir	White fir	Engelmann spruce	Pinyon/ juniper	Total softwoods	Aspen	Cotton-wood	Other hardwoods	Total hardwoods	
	GROWING STOCK Thousand cubic feet													
State	9,192	30,052	16	691	3,664	5,788	14,684	620	64,707	10,187	282	37	10,506	75,213
Private	173,959	383,152	2,963	10,423	52,177	89,441	201,294	8,193	921,602	147,798	6,119	535	154,452	1,076,054
Total	183,151	413,204	2,979	11,114	55,841	95,229	215,978	8,813	986,309	157,985	6,401	572	164,958	1,151,267
	SAWTIMBER Thousand board feet, International 1/4-inch rule													
State	32,723	122,101	68	1,921	11,890	18,698	54,622	1,044	243,067	13,503	825	47	14,375	257,442
Private	726,992	1,531,894	11,614	35,322	175,623	301,592	766,158	14,943	3,564,138	300,516	19,477	386	320,379	3,884,517
Total	759,715	1,653,995	11,682	37,243	187,513	320,290	820,780	15,987	3,807,205	314,019	20,302	433	334,754	4,141,959

Table 18.--Net volume of timber on State and private commercial timberland in New Mexico by class of timber, and softwoods and hardwoods, 1980

Class of timber	Softwoods	Hardwoods	All classes
	Thousand cubic feet		
Sawtimber trees:			
Saw-log portion	725,290	57,205	782,495
Upper-stem portion	57,996	3,441	61,437
Total	783,286	60,646	843,932
Poletimber trees	203,023	104,312	307,335
All growing stock trees	986,309	164,958	1,151,267
Sound cull trees	40,974	5,343	46,317
Rotten cull trees	8,899	14,320	23,219
Salvable dead trees	24,615	7,316	31,931
All timber	1,060,797	191,937	1,252,734

Table 19.--Net volume of growing stock on State and private commercial timberland in New Mexico by forest type and species, 1980

Forest type	Species								
	Douglas-fir	Ponderosa pine	Southwestern white pine	Limber fir	Subalpine fir	White fir	Engelmann spruce	Pinyon/ juniper	Total softwoods
	Thousand cubic feet								
Douglas-fir	128,064	26,803	1,958	5,650	580	43,313	5,045	660	212,073
Ponderosa pine	29,375	369,581	88	1,205	68	4,718	614	4,657	410,306
Southwestern white pine	294	--	415	--	--	32	--	--	741
Spruce-subalpine fir	3,907	--	--	504	41,986	613	136,914	--	183,924
Limber pine	1,623	310	--	2,200	405	655	--	--	5,193
White fir	6,016	4,781	190	473	1,396	34,826	631	--	48,313
Engelmann spruce	5,131	782	254	310	3,126	3,689	50,492	--	63,784
Pinyon-juniper	837	5,753	--	--	--	--	--	3,493	10,083
Aspen	7,904	2,663	74	772	8,280	7,383	22,056	1	49,133
Cottonwood	--	2,513	--	--	--	--	226	--	2,739
Mixed hardwoods	--	18	--	--	--	--	--	2	20
All types	183,151	413,204	2,979	11,114	55,841	95,229	215,978	8,813	986,309

Table 19 (con.)

Forest type	Species				All species
	Aspen	Cotton-wood	Other hardwoods	Total hardwoods	
	Thousand cubic feet				
Douglas-fir	14,123	--	42	14,165	226,238
Ponderosa pine	992	489	530	2,011	412,317
Southwestern white pine	--	--	--	--	741
Spruce-subalpine fir	11,179	193	--	11,372	195,296
Limber pine	3,490	--	--	3,490	8,683
White fir	10,256	--	--	10,256	58,569
Engelmann spruce	10,579	--	--	10,579	74,363
Pinyon-juniper	--	--	--	--	10,083
Aspen	107,366	791	--	108,157	157,290
Cottonwood	--	4,928	--	4,928	7,667
Mixed hardwoods	--	--	--	--	20
All types	157,985	6,401	572	164,958	1,151,267

Table 20.--Net volume of sawtimber on State and private commercial timberland in New Mexico by forest type and species, 1980

Forest type	Species								
	Douglas-fir	Ponderosa pine	Southwestern white pine	Limber pine	Subalpine fir	White fir	Engelmann spruce	Pinyon/ juniper	Total softwoods
	Thousand board feet, International 1/4-inch rule								
Douglas-fir	540,112	110,718	7,627	20,675	952	128,882	19,661	1,751	830,378
Ponderosa pine	105,259	1,466,978	447	2,840	--	14,134	2,230	8,059	1,599,947
Southwestern white pine	1,505	--	1,652	--	--	149	--	--	3,306
Spruce-subalpine fir	16,782	--	--	1,941	135,415	2,803	530,314	--	687,255
Limber pine	7,643	1,623	--	8,490	896	2,615	--	--	21,267
White fir	26,360	22,506	830	1,570	6,267	130,927	2,169	--	190,629
Engelmann spruce	21,615	3,461	859	1,091	8,655	13,852	176,125	--	225,658
Pinyon-juniper	2,796	28,095	--	--	--	--	--	6,177	37,068
Aspen	37,643	8,715	267	636	35,328	26,928	89,829	--	199,346
Cottonwood	--	11,825	--	--	--	--	452	--	12,277
Mixed hardwoods	--	74	--	--	--	--	--	--	74
All types	759,715	1,653,995	11,682	37,243	187,513	320,290	820,780	15,987	3,807,205

Table 20 (con.)

Forest type	Species				All species
	Aspen	Cotton-wood	Other hardwoods	Total hardwoods	
	Thousand board feet, International 1/4-inch rule				
Douglas-fir	25,673	--	67	25,740	856,118
Ponderosa pine	702	2,173	366	3,241	1,603,188
Southwestern white pine	--	--	--	--	3,306
Spruce-subalpine fir	7,540	666	--	8,206	695,461
Limber pine	--	--	--	--	21,267
White fir	21,636	--	--	21,636	212,265
Engelmann spruce	17,112	--	--	17,112	242,770
Pinyon-juniper	--	--	--	--	37,068
Aspen	241,356	1,512	--	242,868	442,214
Cottonwood	--	15,951	--	15,951	28,228
Mixed hardwoods	--	--	--	--	74
All types	314,019	20,302	433	334,754	4,141,959

Table 21.--Net annual growth of growing stock and sawtimber on State and private commercial timberland in New Mexico by ownership class and species, 1979

Ownership class	Species						
	Douglas-fir	Ponderosa pine	Southwestern white pine	Limber pine	Subalpine fir	White fir	Engelmann spruce
	GROWING STOCK Thousand cubic feet						
State	230	636	([1])	16	97	125	392
Private	3,977	8,784	44	265	1,247	1,774	5,886
Total	4,207	9,420	44	281	1,344	1,899	6,278
	SAWTIMBER Thousand board feet, International 1/4-inch rule						
State	887	2,874	1	47	509	376	2,230
Private	17,942	39,356	139	613	5,551	6,888	27,626
Total	18,829	42,230	140	660	6,060	7,264	29,856

Table 21 (con.)

Ownership class	Species						All species
	Pinyon/ juniper	Total softwoods	Aspen	Cottonwood	Other hardwoods	Total hardwoods	
	GROWING STOCK Thousand cubic feet						
State	--	1,496	280	18	([1])	298	1,794
Private	--	21,977	3,963	220	-5	4,178	26,155
Total	--	23,473	4,243	238	-5	4,476	27,949
	SAWTIMBER Thousand board feet, International 1/4-inch rule						
State	--	6,924	541	61	-1	601	7,525
Private	--	98,115	12,057	580	-34	12,603	110,718
Total	--	105,039	12,598	641	-35	13,204	118,243

[1]Less than 500 cubic feet.

Table 22.--Annual mortality of growing stock and sawtimber on State and private commercial timberland in New Mexico by ownership class, and softwoods and hardwoods, 1979

Species group and ownership class	Growing stock	Sawtimber
	Thousand -cubic feet-	Thousand -board feet[1]-
Softwoods:		
State	135	497
Private	1,435	5,466
Total	1,570	5,963
Hardwoods:		
State	10	18
Private	284	640
Total	294	658
All owners	1,864	6,621

[1]International 1/4-inch rule.

Table 23.--Annual mortality of growing stock and sawtimber on State and private commercial timberland in New Mexico by cause of death and species, 1979

Cause of death	Species										
	Douglas-fir	Ponderosa pine	South-western white pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	Other hardwoods	Total hardwoods	All species
	GROWING STOCK										
	Thousand cubic feet										
Insects	--	25	--	28	23	83	159	59	--	59	218
Disease	--	17	--	--	69	--	86	69	--	69	155
Fire	57	202	--	--	66	--	325	--	--	--	325
Animal	--	--	--	--	--	--	--	--	--	--	--
Weather	--	21	12	--	21	--	54	--	--	--	54
Suppression	--	11	--	--	--	--	11	--	--	--	11
Unknown	38	389	--	83	232	57	799	95	7	102	901
Logging	--	108	--	--	28	--	136	64	--	64	200
Total	95	773	12	111	439	140	1,570	287	7	294	1,864
	SAWTIMBER										
	Thousand board feet, International 1/4-inch rule										
Insects	--	135	--	137	96	403	771	--	--	--	771
Disease	--	86	--	--	256	--	342	102	--	102	444
Fire	105	897	--	--	291	--	1,293	--	--	--	1,293
Animal	--	--	--	--	--	--	--	--	--	--	--
Weather	--	92	45	--	89	--	226	--	--	--	226
Suppression	--	--	--	--	--	--	--	--	--	--	--
Unknown	72	1,907	--	192	746	298	3,215	517	39	556	3,771
Logging	--	--	--	--	116	--	116	--	--	--	116
Total	177	3,117	45	329	1,594	701	5,963	619	39	658	6,621

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Presents land area, commercial timberland area, timber inventory, and growth and mortality data based on Forest Survey standards.

KEYWORDS: forest surveys (regional), forest area classification, stand volume

The Intermountain Station, headquartered in Ogden, Utah, is one of eight regional experiment stations charged with providing scientific knowledge to help resource managers meet human needs and protect forest and range ecosystems.

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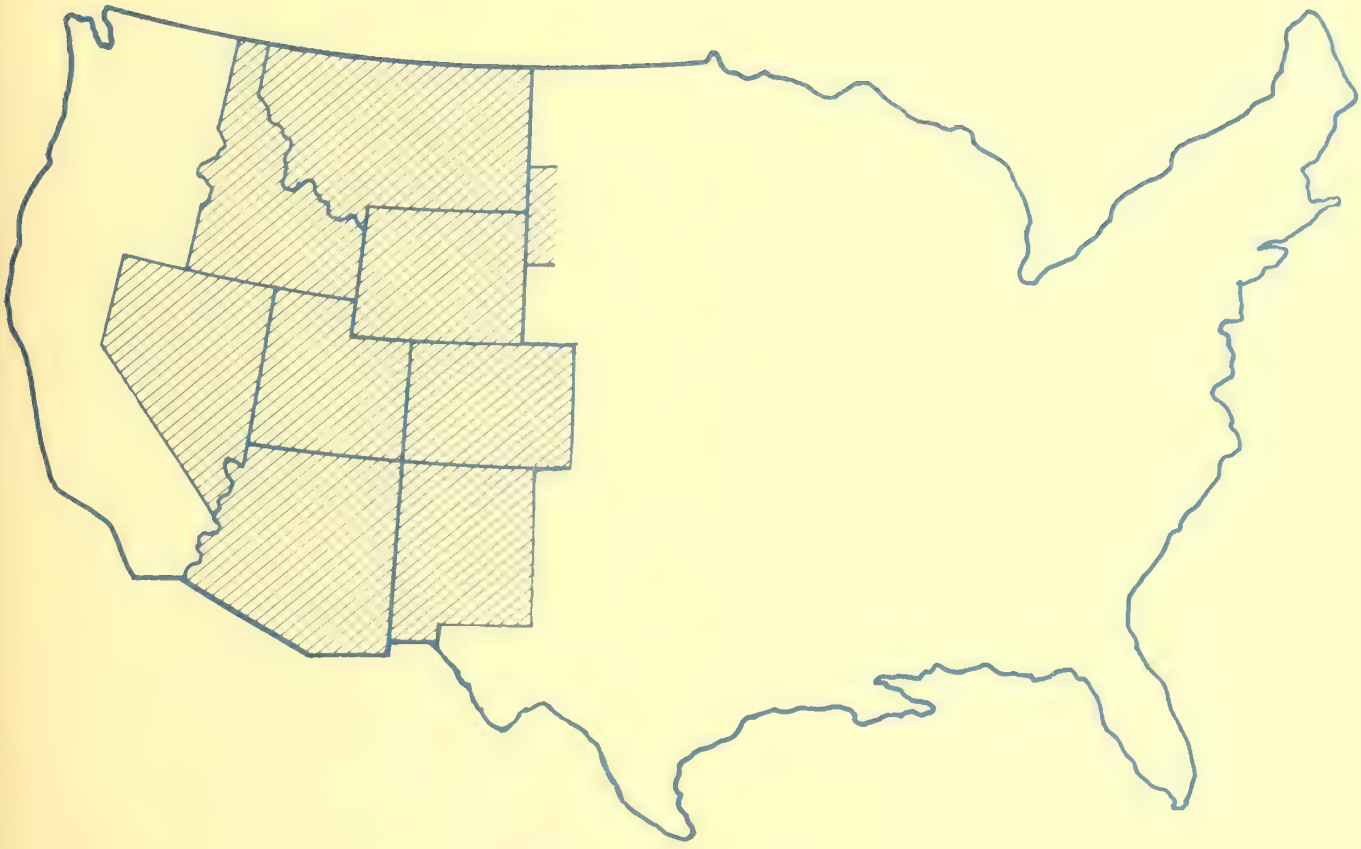
Forest Resources of the Rocky Mountain States

Alan W. Green
Dwane D. Van Hooser

GOVERNMENT



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PREFACE

Forest Survey is a continuing nationwide undertaking conducted by the USDA Forest Service with the primary objective of providing an assessment of the renewable resources on the Nation's forest and range lands. This requires periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

The resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, Wyoming, and western South Dakota are conducted by the Intermountain Forest and Range Experiment Station, with headquarters in Ogden, Utah. These inventories provide information on the extent and condition of State and privately owned forest lands, volume of timber, and rates of timber growth and mortality. These data, when combined with similar information for Federal lands, provide a basis for the formulation of forest policies and programs and for the orderly development and use of the resources.

RESEARCH SUMMARY

Presents highlights of the forest resources of the Rocky Mountain States as of 1977. Describes the forest resources, their extent and location, and some considerations for their future use and management. Includes statistical tables: area by land classes, ownership, growing stock volumes, net annual growth, mortality, roundwood products output, and logging residues.

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Forest Resources of the Rocky Mountain States

Alan W. Green
Dwane D. Van Hooser

TODAY'S FOREST

The forest cover in the Rocky Mountain States is as varied as the landscape it helps create. The extent of occurrence of major species making up western forests is a function of the habitat conditions. From the lower timberline in the hot and dry environment above the desert floor, to the cold and wet environment at the upper timberline in the high country, various tree species may grow in pure stands or in mixtures.

Major Forest Types

Five forest types make up 82 percent of the forest area.

The five largest forest types in the Rocky Mountains total some 113 million acres and are, in order of area, pinyon-juniper, ponderosa pine, Douglas-fir, lodgepole pine, and fir-spruce. Together, these softwood (coniferous) types account for roughly 82 percent of the forest area. The major hardwood (deciduous) type is aspen.

Pinyon-juniper.—This woodland type occupies over 42 million acres, principally in the arid regions of Arizona, New Mexico, western Colorado, Utah, and Nevada. It is the predominant forest in Arizona, New Mexico, Utah, and Nevada. Occupying an altitudinal zone below ponderosa pine and above the semidesert shrub (chaparral), it is a rather uniform type with few tree species. The principal species are alligator, Utah, western, one-seeded juniper and pinyon, and singleleaf pinyon pine. However, composition changes geographically and can vary from pure pinyon pine to pure juniper. Nearly all the pinyon pine in Nevada is singleleaf pinyon.

Nearly a third is P-J.

Ponderosa pine is found in all states...

in pure stands...

and with other conifers.

Ponderosa pine.—The ponderosa pine type occurs in all the Rocky Mountain States, occupying an area of almost 19 million acres, nearly half of it in Arizona and New Mexico. Found primarily in the arid transition zone, it is the first forest type of importance for wood fiber production above the desert floor in the Southwest. It often consists of pure stands of ponderosa pine, especially in Arizona, New Mexico, and the Black Hills of South Dakota. In Idaho and Montana there is a greater association with Douglas-fir, larch, and other species requiring more moisture. On the southern-facing slopes and drier sites, ponderosa pine will predominate, while on northern slopes and more moist areas, greater numbers of associated species are the rule. Toward the upper limit of the type, the true firs and Douglas-fir usually form an understory that does not allow ponderosa pine to replace itself.

Douglas-fir.—This type occupies the area immediately above the ponderosa pine zone and below the fir-spruce type. This puts it in the elevational zone of between 8,000 and 9,500 feet in the South and 2,000 to 7,000 feet in the North. Over 12 million of the total 17.8 million acres of this type are in Idaho and Montana.

Douglas-fir is at higher elevations.

Pure stands of Douglas-fir are found in southern Idaho, central and eastern Montana, northern Colorado, Wyoming, and Utah, wherever it has developed as a climax forest. In Montana and northern Idaho, grand fir, Engelmann spruce, and western larch are common associates in the type and frequently are the dominant species.

Lodgepole pine.—This major type in the West typically consists of pure or nearly pure, very dense stands of its namesake species. Stands having thousands of stems per acre are not uncommon. Of the nearly 17 million acres, about 60 percent is in Idaho and Montana. Most of the remaining is in western Wyoming and central Colorado.

Pure stands of lodgepole can be a headache to land managers when the bugs hit.

Seral lodgepole pine stands are frequently replaced through succession by other conifers such as Douglas-fir and subalpine fir. However, many pure stands of lodgepole pine take on the appearance of a climax type, the replacement by other species not happening at all or at least very slowly. Typical dense stands in this type have little diversity of understory flora.

Fir-spruce.—Nearly 16 million of the 17 million acres of the fir-spruce type are found in Idaho, Montana, Wyoming, Colorado, and Utah. It occupies areas at higher elevations where temperatures are cool and moisture abundant. Grand fir, subalpine fir, and Engelmann spruce are the major species. Some of the more common associates in the Northern Rocky Mountains are larch, aspen, lodgepole pine, and Douglas-fir. Mountain hemlock is found in association with whitebark pine, subalpine fir, and Engelmann spruce at higher altitudes, going to timberline.

These forests are the picture book favorites.

In Colorado, Wyoming, and Utah, this type is the uppermost forest cover, going to timberline. The mountain hemlock type is a local geographic variant of the fir-spruce type in northern Idaho and shares common associated species with the fir-spruce type.

White pine and larch forests are seral and geographically restricted.

Western white pine.—This seral type is centered on the midelevation sites of northern Idaho where the oceanic climatic influences are strongest. In it, there is a general mixture of western redcedar, western hemlock, grand fir, Douglas-fir, and western larch with ponderosa pine at lower and Engelmann spruce at higher elevations.

Larch.—This type occurs in Montana west of the Continental Divide, and in Idaho north of the Salmon River. Western larch, a deciduous conifer, is a seral or temporary species maintained by fire. In drier and warmer environments, associated species are ponderosa pine and Douglas-fir. On mesic (moist) sites, grand fir, western hemlock, western redcedar, and western white pine are commonly found with larch. In a cool environment at higher elevations, associated species are Engelmann spruce and subalpine fir.

Most of the hemlock ecosystem is in Idaho.

Hemlock.—This is represented by both western and mountain hemlock as major species. Western hemlock is a major component at elevations up to 4,500 feet with western redcedar and grand fir as a major associate species. About 80 percent of this type is in Idaho.

Aspen.—This occupies about 7.1 million acres in the Rocky Mountain States, mostly in Utah and Colorado. Although it commonly occurs as pure stands, it also appears in association with one or more coniferous species. On most sites it is eventually replaced by more shade-tolerant forests such as spruce and fir.

Aspen decorates over 7 million acres, mostly in Colorado and Utah.

Aspen differs from other species in that regeneration is almost entirely by root suckering. Stands are a mosaic of clones, each with genetically identical trees. Different clones can be recognized by bark color, ranging from white to dark olive.

People tend to look at aspen as a decorator species that, with its golden leaves, signals the coming of autumn. But it has considerable value for wildlife and wood. Mine props, excelsior, matches, and crating are among current uses.

How Much Forest?

Forests cover one-fourth of the Rocky Mountain States.

The area of productive and unproductive forest is nearly equal.

In 1977 there were an estimated 138 million acres of forest land (about 25 percent of the total land area) in the Rocky Mountain States (table 1). This is about the same as reported in 1970. Nearly 58 million acres are classed as commercial timberland[1] suitable and available for timber-growing activities for the production of industrial wood:

Land class	Area
	(Million acres)
Commercial timberland	57.5
All other forest land:	
Productive reserved	8.4
Deferred	3.2
Unproductive	69.2
Total	138.3

[1]Commercial timberland is defined as forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. Areas qualifying must have the capability of producing in excess of 20 cubic feet per acre per year of industrial wood in natural stands. Currently included are inaccessible and inoperable areas.

Table 1.--Total land area in the Rocky Mountain States by major class of land and State, 1977

State	Commercial forest land			Noncommercial forest land				Total forest land area	Nonforest land area	Total land area[1]
	Commercial	Productive deferred	Total	Productive reserved	Other forest reserved	Other forest nonreserved	Total			
	Thousand acres									
Northern Rocky Mountain States:										
North Idaho	7,716.9	498.2	8,215.1	856.2	369.0	830.2	2,055.4	10,270.5	2,236.5	12,507.0
South Idaho	5,823.7	437.1	6,260.8	1,056.8	242.2	3,896.3	5,195.3	11,456.1	28,928.0	40,384.1
Western Montana	9,396.1	367.1	9,763.2	1,163.5	624.2	1,010.7	2,798.4	12,561.6	3,321.1	15,882.7
Eastern Montana	4,963.3	341.6	5,304.9	838.3	750.4	3,104.1	4,692.8	9,997.7	67,168.0	77,165.7
Western South Dakota	1,244.1	0	1,244.1	11.1	1.3	110.8	123.2	1,367.3	5,504.1	6,871.4
Wyoming	4,334.2	331.3	4,665.5	2,688.6	292.0	2,382.2	5,362.8	10,028.3	52,044.7	62,073.0
Total	33,478.3	1,975.3	35,453.6	6,614.5	2,279.1	11,334.3	20,227.9	55,681.5	159,202.4	214,883.9
Southern Rocky Mountain States:										
Arizona	3,895.6	19.1	3,914.7	382.8	760.8	13,435.6	14,579.2	18,493.9	54,151.2	72,645.1
Colorado	11,314.7	752.2	12,066.9	684.0	321.0	9,199.1	10,204.1	22,271.0	44,029.7	66,300.7
Nevada	134.3	0	134.3	5.9	66.6	7,476.5	7,549.0	7,683.3	62,648.6	70,331.9
New Mexico	5,537.5	279.5	5,817.0	550.5	503.5	11,188.8	12,242.8	18,059.8	59,594.6	77,654.4
Utah	3,151.3	157.3	3,308.6	124.3	428.7	12,205.0	12,758.0	16,066.6	36,460.1	52,526.7
Total	24,033.4	1,208.1	25,241.5	1,747.5	2,080.6	53,505.0	57,333.1	82,574.6	256,884.2	339,458.8
Total, all Rocky Mountain States	57,511.7	3,183.4	60,695.1	8,362.0	4,359.7	64,839.3	77,561.0	138,256.1	416,086.6	554,342.7

[1]From U.S. Bureau of the Census, land and water area of the United States, 1980.

The forest area is still slowly declining.

Trends.—The general downward trend in total forest area is continuing, even though the 1977 estimate of forest land area was the same as that reported in 1970. Changes of several thousands of acres become obscured when rounded to millions of acres.

New inventories...

and changes in land use continually change the numbers reported.

During the time the 1977 estimates were being developed, 1,153 roadless areas on National Forests with wilderness potential were being studied under the second Roadless Area Review and Evaluation (RARE II) process. The Congress has been acting on the recommended areas in piecemeal fashion. Some areas have been legislated into the wilderness system, and some of these are being contested in the courts. Legislation is pending on many other areas. In addition, data from recent inventories in several States are not yet available for inclusion in this report. Successively reported forest area figures are mostly useful for identifying trends over some extended period.

Use trends have changed in the last 150 years...

Outlook.—Tracing historical trends in forest area in the Rocky Mountains is difficult. Much forest land was cleared of trees for early settlement, and in many cases, forests were exploited for such things as rail ties, mine timbers, and charcoal for ore reduction. Most of the areas cleared for these uses have reverted to forest.

and will in the future.

The prospects are for a relatively stable acreage of forest land. Although some decline in area can be expected from such activities as water development projects and conversion to range, these reductions should be minor and generally will take place on the lower productivity forest lands. In parts of Idaho, Montana, and Colorado the subdivision of forest land into parcels for home sites has changed the ownership pattern in some highly productive forested valleys. To date, there is no good indication of the total commercial timberland areas that will fall from the timber-growing base in favor of wilderness. The best guess is that more of the areas recommended will be included in the system.

The commercial timber base is projected to drop another 4.5 million acres.

The downward trend in forest land area is expected to continue, but the extent of it cannot be accurately predicted. Clearing for roads, urban development, power transmission rights-of-way, and surface mining will continue. The area of commercial timberland is projected to decrease to about 53 million acres by the year 2030 (table 2).

Table 2.--Area of commercial timberland in the Rocky Mountain States by owner class, 1952, 1962, 1970, and 1977, with base level projections to 2030

Owner class	1952	1962	1970	1977	Projections 1990	2000	2010	2020	2030
					Million acres				
National Forest	41.9	42.5	40.3	36.4	35.2	34.7	34.2	33.8	33.5
Other public	7.2	7.2	7.2	6.6	6.7	6.7	6.7	6.7	6.6
Private	14.8	14.7	14.6	14.5	14.3	13.8	13.2	13.1	12.9
All owners	63.9	64.4	62.1	57.5	56.2	55.2	54.1	53.6	53.0

The Owners

National Forest Systems have 63 percent of the total forest...

and 85 percent of the public commercial timberland.

The ownership pattern for forest land in the Rocky Mountain States is the same as in the past: three-fourths of it is publicly owned, and the USDA Forest Service takes care of more of it than anyone else. The 36.4 million acres of the National Forest System constitutes 85 percent of all publicly administered commercial timberland and 63 percent of the total. More than half the National Forest system is in the northern States, most of it in Montana and Idaho (tables 3 and 4).

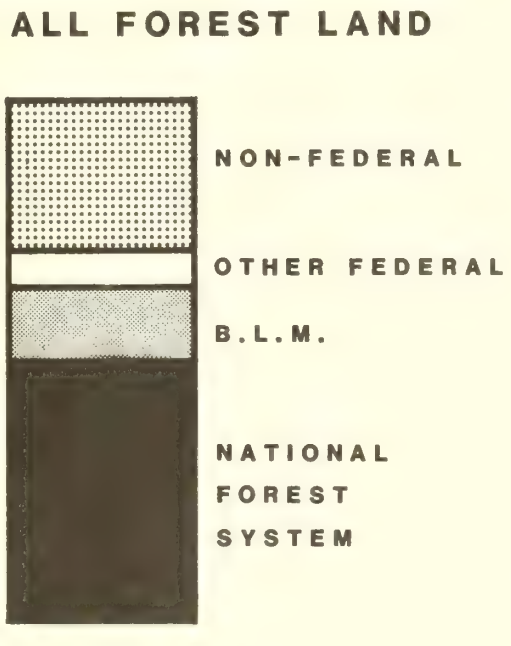


Table 3.--Forest and range lands in the Rocky Mountain States by ownership and State, 1977

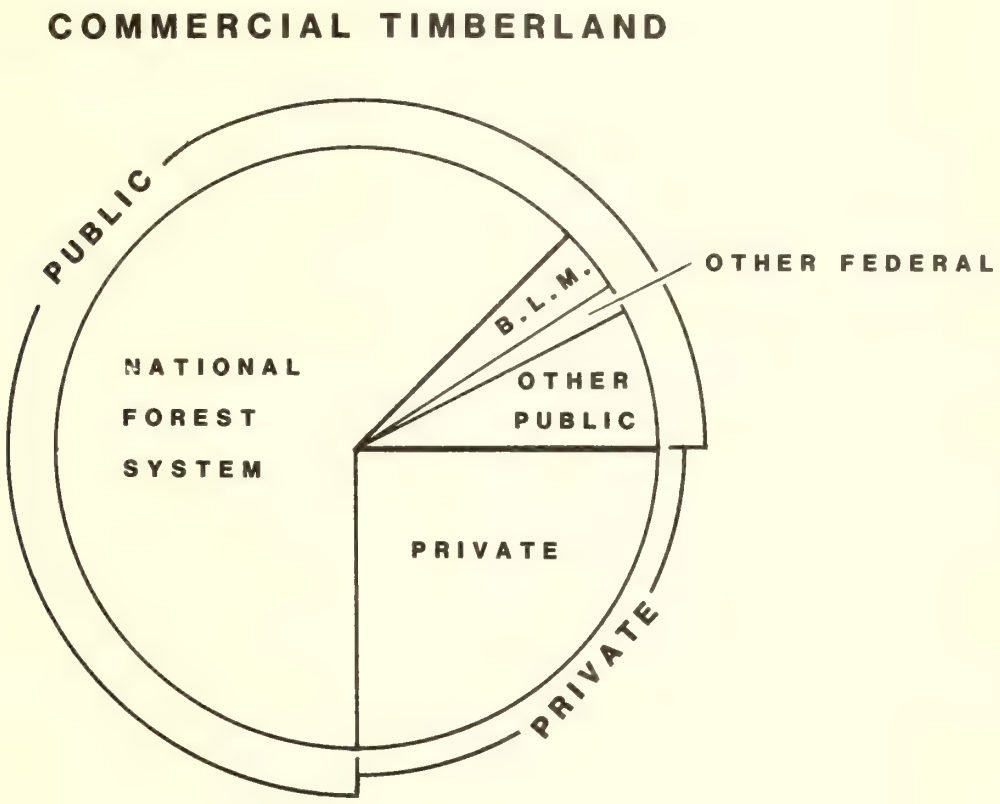
Ownership	Northern Rocky Mountain States					Southern Rocky Mountain States						Total, Rocky Mountain States
	Idaho	Montana	Western South Dakota	Wyoming	Total	Arizona	Colorado	Nevada	New Mexico	Utah	Total	
	Thousand acres											
Forest land:												
National Forest	16,235.3	13,817.2	982.8	5,652.7	36,688.0	6,437.8	10,350.9	2,402.9	7,181.6	5,076.9	31,450.1	68,138.1
BLM	465.2	834.0	8.6	723.1	2,030.9	1,868.0	3,322.2	3,986.8	2,015.1	6,204.1	17,396.2	19,427.1
Other Federal	39.0	1,672.2	12.6	2,124.2	3,848.0	1,741.2	629.5	240.5	693.1	944.1	4,248.4	8,096.4
Non-Federal	4,987.1	6,235.9	363.3	1,528.3	13,114.6	8,446.9	7,968.4	1,053.1	8,170.0	3,841.5	29,479.9	42,594.5
Total	21,726.6	22,559.3	1,367.3	10,028.3	55,681.5	18,493.9	22,271.0	7,683.3	18,059.8	16,066.6	82,574.6	138,256.1
Rangeland:												
National Forest	3,896.5	2,926.9	486.5	3,575.6	10,885.5	5,027.7	3,376.3	3,987.5	1,394.0	3,047.3	16,832.8	27,718.3
BLM	11,519.8	7,308.0	143.3	16,683.9	35,655.0	10,728.0	5,032.8	44,389.2	10,941.9	16,514.3	87,606.2	123,261.2
Other Federal	226.1	760.7	309.8	165.2	1,461.8	5,147.2	275.5	4,216.0	2,775.5	3,319.1	15,733.3	17,195.1
Non-Federal	7,955.7	42,338.4	3,712.8	26,471.5	80,478.4	24,265.4	19,137.1	4,295.0	33,614.1	6,820.3	88,131.9	168,610.3
Total	23,598.1	53,334.0	4,652.4	46,896.2	128,480.7	45,168.3	27,821.7	56,887.7	48,725.5	29,701.1	208,304.2	336,784.9
Forest and Range Lands:												
National Forest	20,131.8	16,744.1	1,469.3	9,228.3	47,573.5	11,465.5	13,727.2	6,390.4	8,575.6	8,124.2	48,282.9	95,856.4
BLM	11,985.0	8,142.0	151.9	17,407.0	37,685.9	12,596.0	8,355.0	48,376.0	12,957.0	22,718.4	105,002.4	142,688.3
Other Federal	265.1	2,432.9	322.4	2,289.4	5,309.8	6,888.4	905.0	4,456.5	3,468.6	4,263.2	19,981.7	25,291.5
Non-Federal	12,942.8	48,574.3	4,076.1	27,999.8	93,593.0	32,712.3	27,105.5	5,348.1	41,784.1	10,661.8	117,611.8	211,204.8
Total	45,324.7	75,893.3	6,019.7	56,924.5	184,162.2	63,662.2	50,092.7	64,571.0	66,785.3	45,767.6	290,878.8	475,041.0

Table 4.--Area of commercial forest land in the Rocky Mountain States by ownership class, 1977

State	Owner class								All owners
	National Forest	BLM	Indian	Misc. Federal	State	County & municipal	Forest industry	Farmer	Misc. private	
	Thousand acres									
Northern Rocky Mountain States:										
North Idaho	4,212.7	178.8	61.3	7.7	651.3	18.9	777.6	631.0	1,177.6	7,716.9
South Idaho	4,940.5	230.2	8.7	--	209.7	--	169.1	146.1	119.4	5,823.7
Western Montana	5,641.9	155.4	371.2	2.7	437.2	2.3	1,041.0	468.7	1,275.7	9,396.1
Eastern Montana	2,519.9	264.6	253.7	50.4	92.3	2.4	14.4	1,483.7	281.9	4,963.3
Western South Dakota	952.5	4.8	--	1.0	67.0	3.4	16.1	154.6	44.7	1,244.1
Wyoming	3,044.7	200.0	123.8	--	110.6	--	54.3	619.8	181.0	4,334.2
Total	21,312.2	1,033.8	818.7	61.8	1,568.1	27.0	2,072.5	3,503.9	3,080.3	33,478.3
Southern Rocky Mountain States:										
Arizona	2,461.5	18.0	1,216.2	--	32.1	1.5	--	81.8	84.5	3,895.6
Colorado	7,505.8	422.1	29.8	4.6	188.9	45.1	14.7	2,635.9	467.8	11,314.7
Nevada	61.1	--	--	--	3.4	1.2	8.3	1.8	58.5	134.3
New Mexico	2,818.3	39.4	572.7	8.9	171.1	--	0	1,549.8	377.3	5,537.5
Utah	2,277.0	186.0	50.7	6.3	114.8	3.7	0	303.9	208.9	3,151.3
Total	15,123.7	665.5	1,869.4	19.8	510.3	51.5	23.0	4,573.2	1,197.0	24,033.4
Total all Rocky Mountain States	36,435.9	1,699.3	2,688.1	81.6	2,078.4	78.5	2,095.5	8,077.1	4,277.3	57,511.7

National forests also have the most unproductive forest land.

The other Federal agencies with substantial areas of commercial timberland are the Bureau of Land Management (BLM) and Bureau of Indian Affairs (BIA).[2] Most of the BLM holdings are in the Northern Rocky Mountain States, while Indian lands are primarily in the southern part. The two agencies combined have something less than 5 million acres or 8 percent of the total commercial timberland.



Other public lands are mostly State-owned, with the largest holdings in Idaho and Montana. There is more State-owned forest land in the northern States than in the southern.

Most forest industry lands are in the North.

The major part of the privately owned commercial timberland is held by farmers or ranchers and other private individuals. There are slightly more of these acres in the northern States than the southern. Forest industry lands, on the other hand, are almost entirely in the North, mostly Idaho and Montana. All but about 23,000 of the 2 million acres of industry lands are in the North (table 4).

[2]Although Indian lands are classed as Federally owned because of the nature of their Federal trusteeship and administration, they are actually privately owned by the various tribes.

How Productive Is It?

Compared to the major timber-producing areas around the United States, the productivity of commercial timberland in the Rocky Mountain States is relatively low in terms of wood production. Scant precipitation and thin soils over much of the area, and short growing seasons at higher elevations are major factors influencing land productivity.

Although land productivity is generally low...

Productivity class (ft^3/acre/yr)	Acres (thousands)	Percent of total
20–49	30,078.4	52
50–84	16,412.3	29
85+	11,021.0	19
Total	57,511.7	100

nearly half has the potential to produce over 50 cubic feet per acre year.

About 11 million acres are capable of producing over 85 cubic feet of usable wood per acre per year; this is nearly 20 percent of the total commercial timberland area (appendix II, tables 11 and 12). But still, nearly half the commercial timberland has the potential to produce 50 cubic feet per acre per year or more.

Most high site land is on National Forests in Idaho and Montana.

Most of the high-site land—85 cubic feet and up—is in Idaho and Montana, and because of size of the ownership, most of it (about 75 percent) is on National Forests.

Farmers and other private owners have more high-site land than forest industries simply because they own more land. However, over 70 percent of industry lands are capable of producing over 50 cubic feet per acre per year.

Most forest industry lands can produce over 50 cubic feet per acre per year.

Some variation in productivity exists among types, although many of the differences are attributable to soil-moisture-temperature relationships characteristic of the sites on which these types occur. The types occupying the most highly productive land are hemlock-cedar, larch, Douglas-fir, and fir-spruce.

The most productive lands are occupied by hemlock-cedar, larch, Douglas-fir, and fir-spruce ecosystems;

pinyon-juniper forests don't produce much industrial wood but are valuable for other uses.

At the other end of the scale are the pinyon-juniper and chaparral-mountain shrub types. Because of their very nature and the climatic conditions under which they exist, these types cannot produce even 20 cubic feet of wood per acre per year. However, the combined 49 million acres of these two types have high value for other resource uses.

Some 11.5 million acres of forest land that could produce 20 cubic feet per acre annually are either "reserved" in terms of wood harvest, or are in a "deferred" category while under study for possible inclusion as wilderness.

THE TIMBER BASE

Timber—Kinds and Sizes

Four forest types make up 85 percent of the commercial timberland...

Some 85 percent of the commercial timberland is made up of four forest types: ponderosa pine, Douglas-fir, fir-spruce, and lodgepole pine—in that order. The most extensive is ponderosa pine, covering nearly 16 million acres and dominating forests of the Southwest, the Black Hills of western South Dakota, and the drier sites in Idaho and Montana.

with ponderosa pine and Douglas-fir most extensive.

The more than 12 million acres of Douglas-fir is widely distributed throughout the Rocky Mountains. It generally occupies more moist and productive sites above the ponderosa pine type.

The fir-spruce type and lodgepole pine cover about equal areas, around 10 million acres each. Although in the southern States lodgepole pine is generally found on poor sites, in the North it occupies substantial areas of medium- to high-site land, much the same as fir-spruce. The fir-spruce type is a more significant timber resource in the northern States than the southern.

Aspen is big in Colorado and Utah.

Hardwoods, predominantly aspen and cottonwood, are found largely in the southern States, particularly Utah and Colorado. Overall they are relatively insignificant as commercial timber species but are locally of considerable economic importance for specialty products.

About two/thirds of the commercial timberland is sawtimber stands.

About 67 percent of the commercial timberland in the Rocky Mountain States is occupied by sawtimber stands (fig. 1, tables 5 and 6). Although the averages of percent area in that size class for the northern and southern States are nearly identical to each other and to the total for all Rocky Mountain States, three of the southern States have the highest proportion of commercial timberland in that category, and one, Colorado, has the lowest. Colorado also has the highest proportion in a nonstocked condition.

No concrete management implications can to be drawn from stand size categories alone simply because of the way stand size class is determined. Such categories can be misleading in terms of tree diameter distribution.[3] For example, in ponderosa pine stands in the Southwest, a wide range of tree diameter class is common in sawtimber stands.

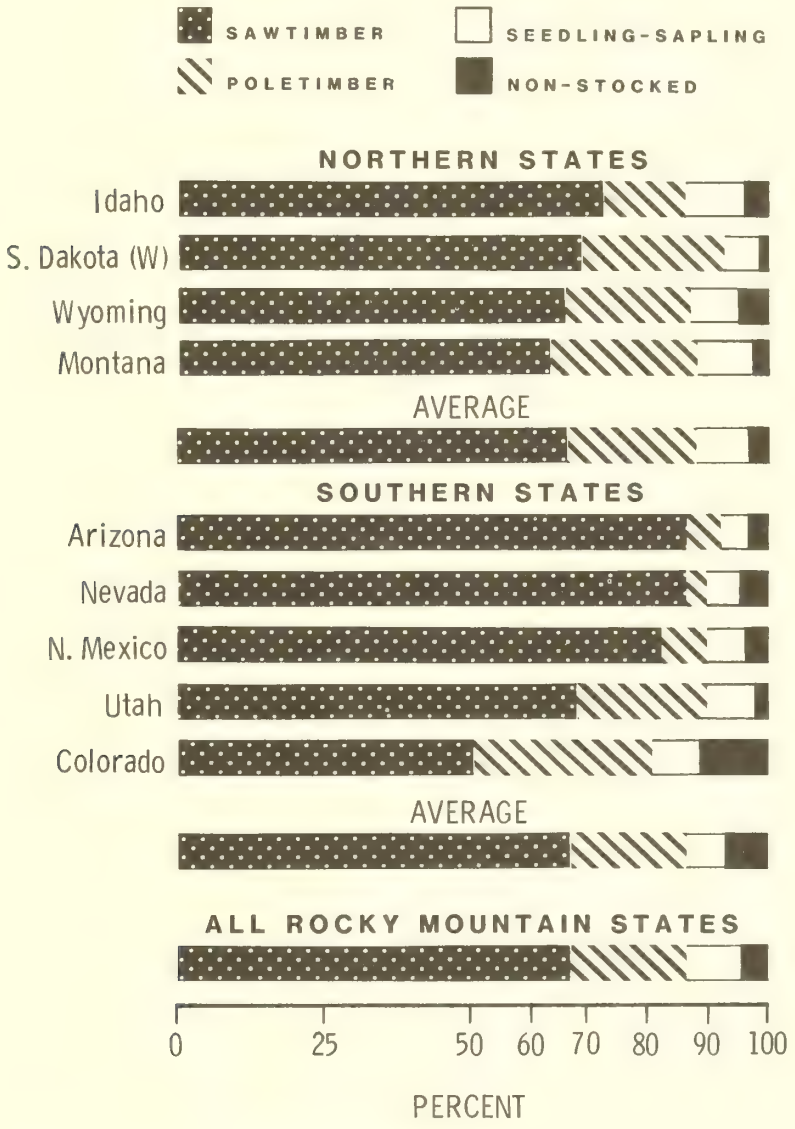


Figure 1.—Percent of commercial timberland by stand-size class, 1977.

[3]Softwood sawtimber **trees** need only be 9.0 inches d.b.h. (hardwoods 11.0 inches); sawtimber **stands** need only have half the total stocking in sawtimber and poletimber trees with sawtimber at least equal to poletimber stocking.

Table 5.--Area of commercial timberland in the Northern Rocky Mountain States by stand-size class, ownership, and State, 1977

Stand-size class and ownership	State				Total
	Idaho	Montana	Western South Dakota	Wyoming	
	Thousand acres				
Sawtimber stands:					
National forest	6,234.1	4,995.2	674.9	1,947.3	13,851.5
Other public	1,093.8	1,055.5	47.8	283.0	2,480.1
Forest industry	813.1	824.0	9.9	38.2	1,685.2
Farm and other private	1,477.6	2,138.4	112.5	537.7	4,266.2
Total	9,618.6	9,013.1	845.1	2,806.2	22,283.0
Poletimber stands:					
National forest	1,592.8	2,165.2	238.3	643.0	4,639.3
Other public	108.7	395.8	12.0	99.7	616.2
Forest industry	21.5	181.1	4.5	13.9	221.0
Farm and other private	160.3	989.8	50.4	223.4	1,423.9
Total	1,883.3	3,731.9	305.2	980.0	6,900.4
Seedling and sapling stands:					
National forest	1,039.2	896.0	37.3	296.6	2,269.1
Other public	129.5	147.7	14.9	20.9	313.0
Forest industry	89.6	38.3	1.7	1.4	131.0
Farm and other private	278.0	305.5	31.5	26.6	641.6
Total	1,536.3	1,387.5	85.4	345.5	3,354.7
Nonstocked stands:					
National forest	287.1	105.4	2.0	157.8	552.3
Other public	34.6	33.2	1.5	30.8	100.1
Forest industry	22.5	12.0	--	.8	35.3
Farm and other private	158.2	76.3	4.9	13.1	252.5
Total	502.4	226.9	8.4	202.5	940.2
All stands:					
National forest	9,153.2	8,161.8	952.5	3,044.7	21,312.2
Other public	1,366.6	1,632.2	76.2	434.4	3,509.4
Forest industry	946.7	1,055.4	16.1	54.3	2,072.5
Farm and other private	2,074.1	3,510.0	199.3	800.8	6,584.2
Total	13,540.6	14,359.4	1,244.1	4,334.2	33,478.3

Table 6.--Area of commercial timberland in the Southern Rocky Mountain States by stand-size class, ownership, and State, 1977

Stand-size class and ownership	State					Total
	Arizona	Colorado	Nevada	New Mexico	Utah	
	Thousand acres					
Sawtimber stands:						
National forest	2,031.7	4,143.9	47.8	2,205.2	1,597.1	10,025.7
Other public	1,236.6	392.2	4.4	754.3	264.5	2,652.0
Forest industry	.0	4.0	7.5	.0	.0	11.5
Farm and other private	135.1	1,271.0	56.8	1,662.7	313.1	3,438.7
Total	3,403.4	5,811.1	116.5	4,622.2	2,174.7	16,127.9
Poletimber stands:						
National forest	176.0	1,718.1	3.3	239.4	501.7	2,638.5
Other public	23.1	273.6	--	16.8	44.8	358.3
Forest industry	.0	10.3	--	.0	.0	10.3
Farm and other private	14.0	1,432.6	--	131.6	127.6	1,705.8
Total	213.1	3,434.6	3.3	387.8	674.1	4,712.9
Seedling and sapling stands:						
National forest	136.8	696.5	5.4	172.1	132.7	1,143.5
Other public	3.9	18.3	.1	18.0	33.5	73.8
Forest industry	.0	.4	.3	.0	.0	.7
Farm and other private	17.2	135.9	1.4	132.8	59.2	346.5
Total	157.9	851.1	7.2	322.9	225.4	1,564.5
Nonstocked stands:						
National forest	117.0	947.3	4.6	201.6	45.5	1,316.0
Other public	4.2	6.4	.1	3.0	18.7	32.4
Forest industry	.0	--	.5	.0	.0	.5
Farm and other private	--	264.2	2.1	--	12.9	279.2
Total	121.2	1,217.9	7.3	204.6	77.1	1,628.1
All stands:						
National forest	2,461.5	7,505.8	61.1	2,818.3	2,277.0	15,123.7
Other public	1,267.8	690.5	4.6	792.1	361.5	3,116.5
Forest industry	.0	14.7	8.3	.0	.0	23.0
Farm and other private	166.3	3,103.7	60.3	1,927.1	512.8	5,770.2
Total	3,895.6	11,314.7	134.3	5,537.5	3,151.3	24,033.4

How Much Wood?

The wood on commercial timberland compressed into a single log would be 200 feet in diameter and reach from Denver to Missoula.

Three-fourths the volume is in sawtimber size trees...

much of it in Idaho and Montana.

The bulk of it is Douglas-fir, lodgepole, and ponderosa pines.

About 70 percent is in trees less than 21 inches d.b.h.

In 1977, the commercial timberland in the Rocky Mountain States contained an estimated, and nearly incomprehensible, wood volume of 112.2 billion cubic feet, 105.5 billion of it softwood species (appendix II, table 65). To get a better perspective of the volume in cubic feet, let us put it in a single log. A log of 112.2 billion cubic feet would be 200 feet in diameter and 678 miles long, stretching from Denver, Colo., to Missoula, Mont.

Some 99.7 billion cubic feet is in softwood and hardwood growing stock trees and 7.7 billion is in salvable dead trees. The remainder is in rough and rotten trees.

More than three-fourths (77 percent) of the softwood growing stock volume is in sawtimber trees with an estimated volume of 390.4 billion board feet (International 1/4-inch log rule) (appendix II, table 64). Much of the sawtimber volume is in the North, again principally in Idaho and Montana.

In the North, Douglas-fir and ponderosa pine make up 40 percent of the sawtimber volume with 74.3 billion board feet and 34.9 billion board feet, respectively. If you add in the 40.4 billion board feet of lodgepole pine, 55 percent of the sawtimber volume in those States is accounted for. In the South, the bulk of both growing stock and sawtimber volume is ponderosa pine and spruce.

About 70 percent of the sawtimber volume is in trees less than 21 inches diameter at breast height (d.b.h.). This reflects a continuation of the downward trend in average tree size in the Rocky Mountains States. Since 1952, the volume in trees larger than 17 inches d.b.h. has declined, while volume in trees less than 17 inches d.b.h. has increased.

Other Forest Land

Noncommercial timberlands are largely pinyon-juniper...

but these lands have high value nontimber uses as well as wood.

Other forest lands are those either not currently suitable or available for timber harvesting for roundwood products. Most of such land is in the Southern Rocky Mountain States and much of it is in pinyon-juniper stands. Arizona, New Mexico, and Utah have the largest areas of unproductive forest. The highest proportion of unproductive forest is in Nevada; all but 2 percent of Nevada's forest land is considered unproductive for timber production. But these lands have high value for nontimber uses.

That pinyon-juniper forests are classed as "noncommercial" does not mean they have no monetary value for the wood produced. There is much interest in the pinyon-juniper land as a source of wood fiber for manufactured products as well as fuel. In the Southwest, pinyon-juniper firewood often commands a higher price per cord than round pulpwood—in some cases, three to four times as much.

Growth, Removals, and Mortality

Net growth is generally low...

As usual, whatever happens in terms of softwood growth, removals, and mortality, in the Rocky Mountain States, more of it happens in Idaho and Montana than anywhere else (tables 7 and 8). For hardwoods, Colorado is first, largely because that is where the bulk of the hardwoods occurs.

Growth.—The net annual growth estimates for the Rocky Mountain States of 1.7 billion cubic feet of growing stock and 6.7 billion board feet of sawtimber (tables 7 and 8) average out at about 29.7 cubic feet and 116.8 board feet per acre. Although such averaging is tenuous, these data do indicate rather significant areas of the low productivity land in the Rocky Mountain States compared to other timber growing regions.

Table 7.--Net annual growth, removals, and mortality of growing stock on commercial timberland in the Rocky Mountain States by softwoods and hardwoods, 1976

State	All species			Softwoods			Hardwoods		
	Growth	Removals	Mortality	Growth	Removals	Mortality	Growth	Removals	Mortality
	Thousand cubic feet								
Northern Rocky Mountain States:									
Idaho	675,899	394,804	123,365	669,563	394,780	121,956	6,336	24	1,409
Montana	478,034	234,802	130,063	473,246	234,792	128,314	4,788	10	1,749
Western South Dakota	39,959	20,410	3,791	38,704	20,410	3,782	1,255	0	9
Wyoming	86,377	19,384	42,055	82,866	19,325	40,860	3,511	59	1,195
Total, Northern Rocky Mountain States	1,280,269	669,400	299,274	1,264,379	669,307	294,912	15,890	93	4,362
Southern Rocky Mountain States:									
Arizona	72,229	83,352	15,133	67,302	83,241	14,136	4,927	111	997
Colorado	209,101	38,670	91,943	151,741	36,400	77,873	57,360	2,270	14,070
Nevada	2,419	75	1,727	2,171	75	1,692	248	0	35
New Mexico	78,811	41,122	36,127	67,480	40,867	31,438	11,331	255	4,689
Utah	65,314	13,057	35,396	51,455	12,401	26,090	13,859	656	9,306
Total, Southern Rocky Mountain States	427,874	176,276	180,326	340,149	172,984	151,229	87,725	3,292	29,097
Total, all Rocky Mountain States	1,708,143	845,676	479,600	1,604,528	842,291	466,141	103,615	3,385	33,459

Table 8.--Net annual growth, removals, and mortality of sawtimber on commercial timberland in the Rocky Mountain States by softwoods and hardwoods, 1976

State	All species			Softwoods			Hardwoods		
	Growth	Removals	Mortality	Growth	Removals	Mortality	Growth	Removals	Mortality
	Thousand board feet, International 1/4-inch rule								
Northern Rocky Mountain States:									
Idaho	2,943,711	2,315,747	561,172	2,931,757	2,315,605	557,538	11,954	142	3,634
Montana	1,412,980	1,308,644	460,066	1,398,405	1,308,591	454,066	14,575	53	6,000
Western South Dakota	168,881	117,173	16,645	167,618	117,173	16,619	1,263	0	26
Wyoming	356,761	104,983	152,608	347,492	104,628	150,551	9,269	355	2,057
Total, Northern Rocky Mountain States	4,882,333	3,846,547	1,190,491	4,845,272	3,845,997	1,178,774	37,061	550	11,717
Southern Rocky Mountain States:									
Arizona	314,790	462,158	68,265	296,793	461,898	65,126	17,997	260	3,139
Colorado	958,524	219,904	328,536	797,944	207,943	306,298	160,580	11,961	22,238
Nevada	10,475	421	9,419	10,144	421	9,324	331	0	95
New Mexico	266,783	243,878	134,727	238,996	242,387	122,706	27,787	1,491	12,021
Utah	287,318	79,212	123,710	245,323	77,092	103,010	41,995	2,120	20,700
Total, Southern Rocky Mountain States	1,837,890	1,005,573	664,657	1,589,200	989,741	606,464	248,690	15,832	58,193
Total, all Rocky Mountain States	6,720,223	4,852,120	1,855,148	6,434,472	4,835,738	1,785,238	285,751	16,382	69,910

but the trend is up...

In spite of generally low growth per acre, the trend in net annual growth of softwoods is up, as it has been since 1952, for both cubic foot and board foot volume:

Net growth of growing stock
(Million cubic feet)

	1952	1962	1970	1976
North	863.1	983.3	1,153.8	1,280.3
South	290.6	335.6	379.5	427.9
Total	1,153.7	1,318.9	1,533.3	1,708.2

Net growth of sawtimber
(Million board feet)

	1952	1962	1970	1976
North	3,323.0	3,605.0	3,996.2	4,882.3
South	941.0	1,043.0	1,244.4	1,837.9
Total	4,264.0	4,648.0	5,240.6	6,720.2

on all commercial timberland.

The trend is the same for all ownerships.

Low growth stands and high mortality are major factors.

The primary factors of low net growth per acre are large areas of old-growth sawtimber stands, stagnated stands of smaller size trees such as lodgepole pine, large areas of understocked stands, and a high mortality rate.

Removals trend reversed since 1970 except for other public and other private land.

Removals.—The recent increasing trend in removals from growing stock and sawtimber (1952 to 1970) has reversed (fig. 2). As of 1976, removals were estimated at 846 million cubic feet per year in the Rocky Mountain States (table 7). Sawtimber removals were slightly less than 5 billion board feet, of which only about 16 million were hardwoods (table 8). About 45 percent of sawtimber removals were ponderosa pine and Douglas-fir.

Ponderosa pine and Douglas-fir still the most used sawtimber species.

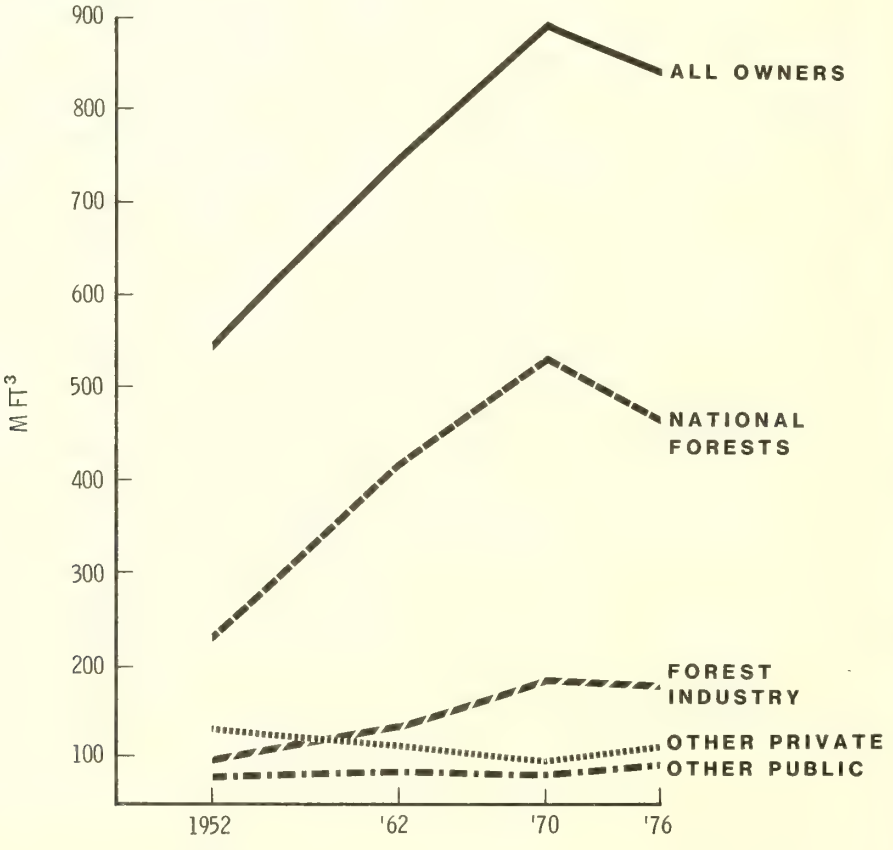


Figure 2.—Removals from growing stock, 1952-76, all Rocky Mountain States.

Although the greatest volumes came from the National Forests, the greatest percent decrease was from the National Forests. In more recent years over 50 percent of the harvest in the northern States has come from private land. This is reverse from traditional heavy reliance on public lands for timber supplies.

The general trend and percent decline are the same for both growing stock and sawtimber removals. By looking at the periods from 1952 to 1970 and 1970 to 1976, the general trend by ownership category can be seen:

	Removals			
	Percent change		Percent of total	
Owner category	(1952–1970)	(1970–1976)	(1952–1970)	(1970–1976)
National Forest	+128	−12	68	55
Other public	+ 8	+ 8	8	11
Industry	+ 88	− 5	16	21
Other private	− 26	+18	8	13
All owners	+ 66	− 5	100	100

A fickle economy has reduced the demand for roundwood products.

The declines in removals, especially from National Forests and industry lands, largely stems from a sagging demand for wood products due to the economic flip-flops of the Nation and the attendant rippling effect through the major sectors.

Three-fourths of removals were sawlogs...
but 92 million cubic feet were left in the woods as residues.

Saw logs made up 75 percent of all removals (appendix II, table 76). But the second biggest source of removals from growing stock is the usable portion of sawtimber or poletimber trees left in the woods during and after harvest—over 92 million cubic feet of logging residues.

In 1976 mortality losses were 480 million cubic feet.

Mortality.—Mortality of growing stock in 1976 was estimated at nearly 480 million cubic feet (table 7). Sawtimber losses were nearly 2 billion board feet.

Insects are major cause and bark beetles are major devastators.

Insects continue to be the major culprits and the bark beetles seem to be the worst offenders. In the northern States, the Douglas-fir beetle and larch casebearer caused much of the nearly 300 million cubic foot loss. In the southern States the mountain pine and spruce beetles get a lot of the credit.

Current serious problem areas—

Losses are distributed between the North and South in about the same proportion as the area of commercial timberland—about 60 and 40 percent, respectively. And the greatest losses were on National Forests simply, again, because they have the most land and in some cases the least developed access. The species hardest hit are Douglas-fir, ponderosa pine, lodgepole pine, western larch, and Engelmann spruce.

lodgepole pine stands in Montana, Idaho, Wyoming, and Utah.

Mountain pine beetle infestations are heavy in some areas and spreading rapidly in many others. Control efforts are meeting with mixed success. Some major areas of concern are the ponderosa pine in the Black Hills of South Dakota and lodgepole and ponderosa pine in Wyoming, Montana, Idaho, and Utah. In 1981, there were an estimated 3.8 million acres of ponderosa and lodgepole pine in the Rocky Mountain States infested to some degree with mountain pine beetle.[4] Lodgepole pine in Montana is suffering the most (2.3 million acres), but beetle activity is on the increase in western Wyoming and Utah.

Wildfires took 90,000 acres of forest.

While the bugs can lay claim to turning the forest red and rust, they cannot turn it black. In 1977 wildfires sent nearly 90,000 acres of forest land up in smoke; 39,000 of it was commercial timberland.[5] The destroyed commercial timberland was split about 50–50 between the North and South. Although lightning started a substantial portion of

[4]U.S. Department of Agriculture, Forest Service. Forest insect and disease conditions in the United States, 1981. Washington, DC: U.S. Department of Agriculture, Forest Service; May 1982. 51 p.

[5]U.S. Department of Agriculture, Forest Service. 1977 wildfire statistics. Washington, DC: U.S. Department of Agriculture, Forest Service; 1979. 56 p.

the fires, people apparently started about 9,000, mostly by burning debris and walking away from campfires. Lower than normal precipitation over the winter and spring made for a long fire season for the entire Rocky Mountain area.

Lightning caused many fires, but people started about 9,000.

It is difficult to estimate the volume loss from fire, but using the average stocking level for the Rocky Mountain States of 1,750 cubic feet and 7,200 board feet per acre, we are looking at a *potential* loss of 68.6 million cubic feet or 283 million board feet. In reality much of the burned commercial timber is salvable, but the volume of usable wood recovered varies according to the degree of charring.

There is some potential for salvage in accessible areas with high concentrations of dead material.

Salvage operations work best in areas with a high concentration of salvable material located conveniently near roads. However, many high-concentration areas are isolated in the back country. The most likely candidates would be concentrated areas with recent insect kill or areas where fires killed but did not destroy. But a large part of the mortality is in trees too far scattered to be efficiently salvaged.

Of all the species, lodgepole pine has the most appeal for salvage because of the high rate of use for roundwood products. In total, salvage of recent mortality and existing dead and down material will most likely happen during ongoing harvesting operations.

SOMETHING ABOUT FOREST USES

The forests of the Rocky Mountain States are obviously more than a collection of trees. The trees are the dominant vegetation of a complex of different environments, making up different forest types. As such they have inestimatable value for things other than making boards, plywood, and paper.

Grazing

Livestock.—Some 418 million acres of forest and range land in the Rocky Mountain States (excluding South Dakota) were grazed in 1976, nearly half of it on public lands:[6]

Owner group	Forest	Rangeland	Total
	Thousand acres		
Forest Service	34,594	34,233	68,827
BLM	1,696	124,230	125,926
Other Federal	306	7,963	8,269
Total Federal	35,596	166,426	203,022
Non-Federal	14,672	200,065	214,737
Total Rocky Mountains	51,268	366,491	417,759

In 1978, 6.4 million AUM's were grazed on National Forests alone.

Arizona and Colorado accounted for over half.

In 1978, just on the National Forests in the Rocky Mountains, some 963,000 cattle, 119,000 horses and burros, and 1,164,000 sheep grazed some 6.4 million animal unit months (AUM's) on about 68.8 million acres (table 9). Of the AUM's grazed on National Forests, 4.1 million (64 percent) were grazed in the Southern Rocky Mountain States by some 56 percent of the total number of animals. Arizona and Colorado accounted for over half the grazing in the South and about 30 percent of the total on the National Forests in the Rocky Mountains. Because of the more arid climate, longer grazing seasons, and a much longer history of heavy, sustained grazing, lands in the South generally are in poorer condition for grazing then those in the North.

[6]U.S. Department of Agriculture, Forest Service. An assessment of the forest and rangeland situation in the United States. Forest Resource Report No. 22. Washington, DC: U.S. Department of Agriculture, Forest Service; 1981. 352 p.

Table 9.--Number of animals and AUM's grazed on National Forests, FY78[1]

	Cattle		Horses & burros		Sheep & goats		Total	
	No.	AUM's	No.	AUM's	No.	AUM's	No.	AUM's
	Thousands							
Northern Rocky Mountain States:								
Idaho	120.4	571.9	23.5	11.8	282.6	204.3	426.5	788.0
Montana	127.6	569.1	15.8	13.4	43.2	21.9	186.6	604.4
South Dakota[2]	21.7	116.0	.1	.4	3.7	3.6	25.5	120.0
Wyoming	130.3	590.3	26.1	21.2	190.0	150.9	346.4	762.4
Total, Northern Rocky Mountain States	400.0	1,847.3	65.5	46.8	519.5	380.7	985.0	2,274.8
Southern Rocky Mountain States:								
Arizona	131.3	1,275.9	1.4	13.0	62.4	30.5	195.1	1,319.4
Colorado	176.1	820.5	28.4	16.2	249.0	186.7	453.5	1,023.4
Nevada	61.3	256.1	.7	1.3	47.6	34.2	109.6	291.6
New Mexico	101.2	801.4	4.6	9.2	30.5	18.1	136.3	828.7
Utah	93.1	447.7	18.1	8.9	254.5	203.6	365.7	660.2
Total, Southern Rocky Mountain States	563.0	3,601.6	53.2	48.6	644.0	473.1	1,260.2	4,123.3
Total, Rocky Mountain States	963.0	5,448.9	118.7	95.4	1,163.5	853.8	2,245.2	6,398.1

[1]USDA Forest Service Annual Grazing Statistical Report, FY78

[2]Entire state

Large numbers of wild horses and burros graze the rangelands of the West... often in competition with domestic livestock and other wildlife.

In 1976, there were an estimated 56,300 wild horses and 7,100 wild burros trying to survive on their own in the 10 western States, most of them on BLM rangeland. In some areas, high concentrations of an increasing horse population are having negative impacts on vegetation and soil that in turn affect range productivity. These horses also offer some real competition for other grazing animals, both domestic and wild.

Wildlife

The forest and range lands provide food and shelter for millions of animals and birds. No one knows the number, but according to State fish and game departments, big game animals number in excess of 2.5 million (table 10). These figures are probably low. However, there is no threat of insufficient herbage and browse for a population even five times greater than that estimated. Of more concern is the availability of winter range and thermal and hiding cover in local areas of high resource use, especially during severe winter weather.

The Rocky Mountains are a haven for wildlife of all species.

Table 10.--Current estimates of big game populations in the western States

State	Bison	Pronghorn	Bighorn	Mule and blacktail deer	Elk	Total
Arizona	320	7,000	2,000	130,000	10,000	149,320
Colorado	--	32,000	2,500	325,000	120,000	479,500
Idaho	25	13,250	2,975	210,000	50,600	276,850
Montana	500	86,000	3,000	226,000	100,000	415,500
Nevada	--	5,000	4,000	81,700	200	90,900
New Mexico	--	26,900	800	261,600	27,500	316,800
Utah	150	2,500	450	275,000	13,000	291,100
Wyoming	500	168,000	3,100	280,000	63,000	514,600
Western South Dakota	1,500	no est.	no est.	no est.	no est.	1,500
Total	2,995	340,650	18,825	1,789,300	384,300	2,536,070

Source: State fish and game departments as reported by Wagner, Frederic H. Livestock grazing and the livestock industry. Chapter 9, p. 121-149, in Wildlife and America: Contributions to an understanding of American wildlife and its conservation. H. P. Brokaw, editor, Council on Environmental Quality. 1978.

Minerals

Mineral outputs vary yearly in response to economic demands.

The mineral estate of the Rocky Mountains is enormous. In 1975, minerals valued at over $8 billion were extracted from beneath the forest and range lands. Copper, molybdenum, petroleum, phosphate rock, gold, silver, zinc, coal, natural gas, potassium salts, sodium compounds, cement, and sand and gravel are the principal minerals. Petroleum has the highest value.

Much of the mineral deposits in the Rocky Mountains underlies Federal land simply because Federal agencies have more land than anyone else.

Recreation

Outdoor recreation is one of the big businesses in the Rocky Mountain States, attracting people from all over the world. In 1977 an equivalent of 75 million people spent at least 12 hours having fun on the National Forests in the Rocky Mountains.

The most popular Rocky Mountain States in which to recreate on National Forests were Colorado, Arizona, and Utah, with 18.0, 12.8, and 11.3 million visitor days respectively.[7] These states lead in use of both developed site and dispersed area recreation. Camping, picnicking, and winter sports are major activities for developed areas. Nearly half the dispersed area use was hiking and other off-road activities:

Recreation is big business.

Kind of area	Recreation visitor days (RVD) *(Millions)*
Developed Sites:	
Camping and picnicking	16.4
Winter sports	3.5
Other (recreation, interpretive sites, organization sites, concession sites, motels and lodges, observation sites, etc.)	7.2
Total	27.1
Dispersed areas:	
Hiking and off road	23.0
Water	7.9
Other (hunting, fishing, sightseeing, etc.)	17.0
Total	47.9
Total RVD's	75.0

BLM lands in Nevada, Wyoming, and Idaho had more recreational visitor days than any other States, with sightseeing apparently the predominant pastime on those lands, along with hunting and fishing.[8]

The importance of increased outdoor recreation activities, in addition to the generation of economic activity, lies in potential impacts and/or conflict with other uses of the forest and rangeland resources and their management.

[7]U.S. Department of Agriculture, Forest Service. Report of the Forest Service, FY 1977. Washington, DC: U.S. Department of Agriculture, Forest Service; 1978. 115 p.

[8]U.S. Department of the Interior, Bureau of Land Management. Public land statistics, 1977. Washington, DC: U.S. Department of the Interior, Bureau of Land Management; 1978. 188 p.

About 65 percent takes place outside developed areas.

LOOKING AHEAD

As a force in the forest environment, man's consumptive use of parts of the forest resource...

influences to some degree what goes on in the rest of it.

The forests and rangelands of the Rocky Mountain States are a complex biological environment of naturally changing components that are inextricably bound together. They offer a wide variety of commodity and noncommodity outputs. Consumptive use of parts of these resources effects more rapid changes in the ecosystem. And such use can start chain reactions through other components.

How the forest lands are managed (manipulated) depends on what people want from them. In general, society wants for the future the same kinds of outputs they received in the past. But locally, the level of use or output desired for specific commodities varies and can be in conflict. However, the principal concerns of everyone, land managers and the public alike, are prospective supplies of all outputs from the forest to meet future demands while maintaining land productivity and enhancing environmental quality.

Concerns

Future wood supplies are always a concern...

Always at issue are future wood supplies, be they for lumber, plywood, paper, firewood, or synfuels. And a major consideration in future wood supplies, besides how fast we can grow them, is the availability of wood for conversion into products.

and nontimber use of forest land affects the availability of wood.

"Availability," in this case, has two masters—availability of land on which to grow and cut trees, and the availability of the wood grown to be cut and used. *Land availability* dictates the timber growing base; that area of commercial timberland available for growing crops of trees. *Wood availability* relates to the areas within the commercial timberland where the impact of nontimber uses reduces the percentage of the trees grown that will be cut.

Both land and wood availability are affected primarily by the goals of the owner. Any major changes in ownership of forest land will have attendant changes in the prospective supply of wood in the future merely because of changes in goals and objectives.

Resource management choices often involve conflicting goals.

The trend for more intensive use of forest land brings increasing chances for conflicting goals. For example, if, to assure adequate and timely regeneration of a harvest area, pocket gophers must be controlled, should poison be used and introduced into the food chain of wildlife? Another: Aerial logging on steep slopes in isolated areas is esthetically acceptable and protects the soil. But in many cases light soil disturbance and low intensity harvest precludes adequate natural regeneration and growth of a new stand of trees. The result is higher costs for establishing and growing a new tree crop.

Problems associated with minerals development must be coped with.

Another major concern is the consequence of increasing minerals and energy development. While much of mineral wealth underlies the land, a lot can be surface mined. Activities such as strip mining and oil exploration and drilling have initial adverse impacts on surface resources, but many long-term effects can be mitigated by rehabilitation work at the site. And, of course, locally large-scale minerals development creates socio-economic situations that place increased demands on resources such as water, wood, wildlife, and recreation.

Water is the most vital resource.

Perhaps the major concern for the future is water. From the Mississippi River to the Pacific Ocean, water originating in the Rocky Mountain States is vital. The water probably has the highest economic value of any resource. Any expansion in any sector of the economy from agro-business to defense will raise water requirements to staggering levels. Management of the surface resources will need to be done in such a way as to increase water supplies. Future economic development in the West will be limited by the availability of water.

Cooperative planning is helping to assure adequate future resources and a productive land base.

Today the land management planning process for publicly administered lands is a cooperative effort between Federal and State agencies and the public. As the management alternatives, prospective outputs, and resource consequences are developed with public input, the stage is being set for the future. These plans will guide the activities of land managers in the Rocky Mountain States to assure adequate resources to meet future demands and at the same time maintain the integrity of the land base and the environment.

APPENDIX I: TERMINOLOGY

Acceptable trees—Growing stock trees meeting specified standards of size and quality, but not qualifying as desirable trees.

Area condition class—See stocking.

Bureau of Land Management land—Federal lands administered by the Bureau of Land Management, U.S. Department of the Interior.

Commercial forest land—See commercial timberland.

Commercial species—Tree species suitable for industrial wood products.

Commercial timberland—Forest land that is producing or is capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation. (Note: Areas qualifying as commercial timberland have the capability of producing in excess of 20 cubic feet per acre per year of industrial wood in natural stands. Currently, inaccessible and inoperable areas are included.)

Cord—A pile of stacked wood containing 128 cubic feet within its outside surfaces. The standard dimensions are 4 by 4 by 8 feet.

Cropland—Land under cultivation within the past 24 months, including cropland harvested, crop failures, cultivated summer fallow, idle cropland used only for pasture, orchards, and land in soil improving crops, but excluding land cultivated in developing improved pasture.

Cull trees—Live trees of sawtimber and poletimber size that are unmerchantable for saw logs now or prospectively because of roughness, rot, or species (also see rotten trees and rough trees).

Deferred forest land—National Forest lands that meet productivity standards for commercial forest, but are under study for possible inclusion in the Wilderness System.

Desirable trees—Growing stock trees (1) having no serious defect in quality to limit present or prospective use for timber products; (2) of relatively high vigor; and (3) containing no pathogens that may result in death or serious deterioration before rotation age.

Diameter classes—A classification of trees based on diameter outside bark measured at breast height (4½ feet above the ground). D.b.h. is the common abbreviation for "diameter at breast height." When using 2-inch diameter classes, the 6-inch class, for example, includes trees 5.0 through 6.9 inches d.b.h. inclusive.

Ecosystem—A complete, interacting system of organisms considered together with their environment; for example, a marsh, a watershed, a lake, etc.

Establishment—An economic unit, generally at a single physical location, where business is conducted or where services or industrial operations are performed.

Farmer and other private—All private ownerships except industry.

Farmer-owned lands—Lands owned by a person who operates a farm, either doing the work himself or directly supervising the work.

Forest industry lands—Lands owned by companies or individuals operating wood-processing plants.

Forest land—Land at least 10 percent stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. (Also see Commercial timberland, Productive-reserved forest land, and Other forest land.) Forest land includes transition zones, such as areas between heavily forested and nonforested lands that are at least 10 percent stocked with forest trees, and forest areas adjacent to urban and built-up

lands. Also included are pinyon-juniper and chaparral areas in the West, and afforested areas. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet in width.

Forest site productivity class—A classification of forest land in terms of potential cubic-foot volume growth per acre at culmination of mean annual increment in fully stocked natural stands.

Forest types—A classification of forest land based upon the tree species presently forming a plurality of stocking. For poletimber size trees and larger, stocking is determined from basal area occurrence and for trees less than 5.0 inches d.b.h. from number of trees.

Major western forest type groups:

Douglas-fir—Forests in which Douglas-fir comprises a plurality of the stocking. (Common associates include western hemlock, western redcedar, the true firs, redwood, ponderosa pine, and larch.)

Ponderosa pine—Forests in which ponderosa pine comprises a plurality of the stocking. (Common associates include Jeffrey pine, sugar pine, limber pine, Arizona pine, Apache pine, Chihuahua pine, Douglas-fir, incense cedar, and white fir.)

Lodgepole pine—Forests in which lodgepole pine comprises a plurality of the stocking. (Common associates are alpine fir, western white pine, Engelmann spruce, aspen, and larch.)

Fir-spruce—Forests in which true firs (*Abies* spp.), Engelmann spruce, or Colorado blue spruce, singly or combination, comprises a plurality of the stocking. (Common associates are mountain hemlock and lodgepole pine.)

Aspen—Forests in which aspen comprises a plurality of the stocking.

Hardwoods—Forests in which red alder or other western hardwoods, singly or in combination, comprise a plurality of the stocking.

Pinyon-juniper—Forests in which pinyon pine and/or juniper comprise a plurality of the stocking.

Growing-stock trees—Live sawtimber trees, poletimber trees, saplings, and seedlings meeting specified standards of quality or vigor; excludes cull trees.

Growing-stock volume—Net volume in cubic feet of live sawtimber and poletimber trees from stump to a minimum 4-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.

Growth—See definition for "Net annual growth."

Hardwoods—Dicotyledonous trees, usually broad-leaved and deciduous.

Indian lands—Tribal lands held in fee by the Federal Government but administered for Indian tribal groups and Indian trust allotments.

Industrial wood—All commercial roundwood products except fuelwood.

Land area—Census definition: The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than 1/8 of a statute mile in width; and lakes, reservoirs, and ponds less than 40 acres of area.

Forest Survey definition: Same as above except minimum width of streams, etc., is 120 feet and minimum size of lakes, etc., is 1 acre.

Logging residues—The unused portions of poletimber and sawtimber trees cut or killed by logging.

Mortality—The volume of sound wood in live trees that have died from natural causes during a specified period.

National Forest System land—Federal lands designated by Executive Order or statute as National Forests or purchase units, and other lands under the administration of the Forest Service including experimental areas and Bankhead-Jones Title III lands.

Net annual growth—The net increase in the volume of trees during a specified year. Components of net annual growth include the increment in net volume of trees at the beginning of the specific year surviving to its end, plus the net volume of trees reaching the minimum size class during the year, minus the volume of trees that died during the year, and minus the net volume of trees that became rough or rotten trees during the year.

Net volume in board feet—The gross board-foot volume of trees less deductions for rot or other defect affecting use for lumber.

Net volume in cubic feet—Gross volume in cubic feet less deductions for rot, roughness, and poor form. Volume is computed for the central stem from a 1-foot stump to a minimum 4.0-inch top diameter outside bark, or to the point where the central stem breaks into limbs.

Nonforest land—Land that has never supported forests and lands formerly forested where use for timber management is precluded by development for other uses. (Note: Includes crop lands, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline clearings of any width, and 1- to 40-acre areas of water classified by the Bureau of the Census as nonforest land. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide, and clearings, etc., more than 1 acre in size, to qualify as nonforest land.)

Nonstocked areas—Commercial timberland less than 10 percent stocked with growing stock trees.

Other Federal land—Federal land other than lands administered by the Forest Service or the Bureau of Land Management.

Other forest land—Forest land incapable of producing 20 cubic feet per acre of industrial wood under natural conditions because of adverse site conditions such as sterile soils, dry climate, poor drainage, high elevation, steepness, or rockiness.

Other land—All land area other than forest and range lands.

Other private land—Privately owned land other than forest industry or farmer-owned.

Other public land—Publicly owned land other than National Forest System land.

Other removals—The net volume of growing stock trees removed from the inventory by cultural operations such as timber-stand improvement, by land clearing, and by changes in land use, such as a shift to wilderness.

Other species—Tree species of typical small size, poor form, or inferior quality that normally do not develop into trees suitable for industrial wood products.

Ownership—The property under one owner, including all parcels of land in the United States.

Pasture—Land that is currently improved for grazing by cultivation, seeding, or irrigation.

Plant byproducts—Wood material from primary manufacturing plants (such as slabs, edgings, trimmings, miscuts, sawdust shavings, veneer cores and clippings, and pulp screenings) that are used for some products.

Poletimber stands—Stands at least 10 percent stocked with growing stock trees, of which half or more of the stocking is sawtimber and/or poletimber trees with poletimber stocking exceeding that of sawtimber. (See definition for Stocking.)

Poletimber trees—Live trees of commercial species at least 5.0 inches in diameter at breast height but smaller than sawtimber size, and of good form and vigor.

Potential growth—The average net annual growth per acre attainable in fully stocked natural stands at culmination of mean annual growth of dominant or codominant trees.

Primary manufacturing plants—Plants using roundwood products such as saw logs, pulpwood bolts, veneer logs, etc.

Productive-reserved forest land—Productive public forest land withdrawn from timber utilization through statute or administrative regulations.

Productivity class—A classification of forest land in terms of potential growth in cubic feet of fully stocked natural stands.

Rangeland—Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs, including land revegetated naturally or artificially that is managed like native vegetation. Rangeland includes natural grasslands, savannas, shrublands, most deserts, tundra, alpine communities, coastal marshes, and wet meadows that are less than 10 percent stocked with forest trees of any size.

Removals—The net volume of growing-stock or sawtimber trees removed from the inventory by harvesting; cultural operations, such as timber stand improvement; land clearings; or changes in land use.

Residues:

- Coarse residues—Plant residues suitable for chipping, such as slabs, edgings, and ends.
- Fine residues—Plant residues not suitable for chipping, such as sawdust, shavings, and veneer clippings.
- Logging residues—The unused portions of sawtimber and poletimber trees cut or killed by logging.
- Plant residues—Wood materials from primary manufacturing plants that are not used for any product.
- Urban residues—Wood materials from urban areas, such as newspapers, lumber and plywood from building demolition, and used packaging and shipping wood materials.

Rotten trees—Live trees of commercial species that do not contain a saw log now or prospectively, primarily because of rot (such as when rot accounts for more than 50 percent of the total cull volume).

Rough trees—(a) Live trees of commercial species that do not contain a saw log, now or prospectively, primarily because of roughness, poor form, splits, and cracks, and with less than one-third of the gross tree volume in sound material; and (b) all live trees of noncommercial species.

Roundwood equivalent—The volume of logs or other round products required to produce the lumber, plywood, woodpulp, paper, or other similar products.

Roundwood logs—Logs, bolts, or other round sections cut from trees.

Salvable dead trees—Standing or down dead trees that are considered currently or potentially merchantable by regional standards.

Saplings—Live trees of commercial species 1.0 inch to 5.0 inches d.b.h. and of good form and vigor.

Sapling and seedling stands—Stands at least 10 percent occupied with growing stock trees of which more than half of the stocking is saplings and/or seedlings.

Saw log—A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight, and with a minimum diameter inside bark for softwoods of 6 inches (8 inches for hardwoods) or other combinations of size and defect specified by regional standards.

Saw log portion—That part of the bole of sawtimber trees between the stump and the saw log top.

Saw log top—The point on the bole of sawtimber trees above which a saw log cannot be produced. The minimum saw log top is 7.0 inches diameter outside bark (d.o.b.) for softwoods, and 9.0 inches d.o.b. for hardwoods.

Sawtimber stands—Stands at least 10 percent occupied with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber trees—Live trees of commercial species containing at least one 12-foot saw log or two noncontiguous 8-foot logs, and meeting regional specifications for freedom from defect. Softwood trees must be at least 9 inches d.b.h. and hardwood trees 11 inches d.b.h.

Sawtimber volume—Net volume of the saw log portion of live sawtimber trees in board feet.

Seedlings—Established live trees of commercial species less than 1.0 inch d.b.h. and of good form and vigor.

Softwoods—Monocotyledonous trees, usually evergreen, having needle or scalelike leaves.

Special interest areas—Areas described in the Environmental Policy Act of 1970 that include (1) cultural areas—historic or prehistoric sites and places of obvious future historical value, and (2) natural areas—outstanding examples of the Nation's geological and ecological features.

Standard error—An expression of the degree of confidence that can be placed on an estimated total or average obtained by statistical sampling methods. Sampling errors do not include technique errors that could occur in photo classification of areas, measurement of volume, or compilation of data.

Stand improvement—Measures such as thinning, pruning, release cutting, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.

Stand-size classes—A classification of forest land based on the predominant size of timber present. See Poletimber stands, Sapling and seedling stands, and Sawtimber stands.

State, county, and municipal lands—Lands owned by States, counties, and local public agencies, or lands leased by these governmental units for more than 50 years.

Stocking—Stocking is an expression of the extent to which growing space is effectively utilized by present or potential growing stock trees of commercial species. "Percent of stocking" is synonymous with "percentage of growing space occupied" and means the ratio of actual stocking to full stocking for comparable sites and stands. Basal area is used as a basis for measuring stocking. Full utilization of the site is assumed to occur over a range of basal area. As an interim guide, 60 percent of the normal yield table values has been used to establish the lower limit of this range, which represents full-site occupancy. This is called 100 percent stocking. The upper limit of full stocking has been set at 132 percent. Sites with less than 100 percent stocking represent less than full-site occupancy. Overstocking is characterized by sites with 133 percent or more stocking.

"Stocking percentages" express current area occupancy in relation to specified standards for full stocking based on number, size, and spacing of trees considered necessary to fully utilize the forest land, and are summarized into the following area condition classes:

Class 10—Areas fully stocked (100 to 132 percent) with desirable trees and not overstocked (133 percent or more).

Class 20—Areas fully stocked with desirable trees, but overstocked with all live trees.

Class 30—Areas medium to fully stocked (60 to 99 percent) with desirable trees and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Class 40—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and/or conditions that ordinarily prevent occupancy by desirable trees.

Class 50—Areas poorly stocked (16.7 to 59 percent) with desirable trees, but fully stocked with growing stock trees.

Class 60—Areas poorly stocked with desirable trees, but with medium to full stocking of growing stock trees.

Class 70—Areas nonstocked (less than 16.7 percent) or poorly stocked with desirable trees, and poorly stocked with growing stock trees.

Class 80—Low-risk old-growth stands.

Class 90—High-risk old-growth stands.

Nonstocked—Areas less than 16.7 percent stocked with growing stock trees.

Upper-stem portion—That part of the main stem or fork of sawtimber trees above the saw log top to a minimum top diameter of 4.0 inches outside bark or to the point where the main stem or fork breaks into limbs.

Urban and other areas—Areas within the legal boundaries of cities and towns; suburban areas developed for residential, industrial, or recreational purposes; school yards; cemeteries; roads; railroads; airports; beaches; powerlines and other rights-of-way; or other nonforest land not included in any other specified land use class.

Water—Census definition: Streams, sloughs, estuaries, and canals more than 1/8 of a statute mile in width; and lakes, reservoirs, and ponds more than 40 acres in area.

Forest Survey definition: Same as above except minimum width of streams, etc., is 120 feet, and minimum size of lakes, etc., is 1 acre.

Wilderness—An area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value (from Wilderness Act 1964).

Table 11.--Area of commercial timberland by State and productivity class, 1977

State	Productivity class 85+	50-84	20-49	All classes
	Thousand acres			
Northern Rocky Mountain States:				
North Idaho	4,563.2	2,419.8	733.9	7,716.9
South Idaho	529.1	2,076.2	3,218.4	5,823.7
Total	5,092.3	4,496.0	3,952.3	13,540.6
Western Montana	4,509.1	2,779.0	2,108.0	9,396.1
Eastern Montana	453.9	1,615.0	2,894.4	4,963.3
Total	4,963.0	4,394.0	5,002.4	14,359.4
Western South Dakota	5.1	136.2	1,102.8	1,244.1
Wyoming	143.5	1,430.0	2,760.7	4,334.2
Total, Northern Rocky Mountain States	10,203.9	10,456.2	12,818.2	33,478.3
Southern Rocky Mountain States:				
Arizona	173.0	1,186.2	2,536.4	3,895.6
Colorado	365.2	2,608.6	8,340.9	11,314.7
Nevada	15.9	29.3	89.1	134.3
New Mexico	172.8	1,480.3	3,884.4	5,537.5
Utah	90.2	651.7	2,409.4	3,151.3
Total, Southern Rocky Mountain States	817.1	5,956.1	17,260.2	24,033.4
Total, all Rocky Mountain States	11,021.0	16,412.3	30,078.4	57,511.7

Table 12.--Area of commercial timberland by State, productivity class, and ownership class, 1977

State and productivity class	Ownership class				Total
	National Forest	Other public	Forest industry	Other private	
	Thousand acres				
Northern Rocky Mountain States:					
North Idaho					
20-49	258.1	114.0	56.7	305.1	733.9
50-84	1,074.1	283.2	310.4	752.1	2,419.8
85+	2,880.5	520.8	410.5	751.4	4,563.2
Total	4,212.7	918.0	777.6	1,808.6	7,716.9
South Idaho					
20-49	2,972.7	132.1	40.4	73.2	3,218.4
50-84	1,628.6	230.5	85.9	131.2	2,076.2
85+	339.2	86.0	42.8	61.1	529.1
Total	4,940.5	448.6	169.1	265.5	5,823.7
Western Montana					
20-49	344.5	480.0	419.4	864.1	2,108.0
50-84	1,201.8	388.2	473.1	715.9	2,779.0
85+	4,095.6	100.6	148.5	164.4	4,509.1
Total	5,641.9	968.8	1,041.0	1,744.4	9,396.1
Eastern Montana					
20-49	885.5	545.7	13.6	1,449.6	2,894.4
50-84	1,180.5	117.7	.8	316.0	1,615.0
85+	453.9	--	--	--	453.9
Total	2,519.9	663.4	14.4	1,765.6	4,963.3
Western South Dakota					
20-49	842.7	71.1	13.2	175.8	1,102.8
50-84	104.7	5.1	2.9	23.5	136.2
85+	5.1	--	--	--	5.1
Total	952.5	76.2	16.1	199.3	1,244.1
Wyoming					
20-49	1,663.5	318.6	49.9	728.7	2,760.7
50-84	1,271.8	94.5	3.7	60.0	1,430.0
85+	109.4	21.3	.7	12.1	143.5
Total	3,044.7	434.4	54.3	800.8	4,334.2
Total, Northern Rocky Mountain States:					
20-49	6,967.0	1,661.5	593.2	3,596.5	12,818.2
50-84	6,461.5	1,119.2	876.8	1,998.7	10,456.2
85+	7,883.7	728.7	602.5	989.0	10,203.9
Total	21,312.2	3,509.4	2,072.5	6,584.2	33,478.3

Table 12 (cont.)

State and productivity class	Ownership class				Total
	National Forest	Other public	Forest industry	Other private	
Southern Rocky Mountain States:					
Arizona					
20-49	1,847.0	606.4	0	83.0	2,536.4
50-84	553.6	551.9	0	80.7	1,186.2
85+	60.9	109.5	0	2.6	173.0
Total	2,461.5	1,267.8	0	166.3	3,895.6
Colorado					
20-49	4,826.2	626.4	13.6	2,874.7	8,340.9
50-84	2,392.4	48.7	.8	166.7	2,608.6
85+	287.2	15.4	.3	62.3	365.2
Total	7,505.8	690.5	14.7	3,103.7	11,314.7
Nevada					
20-49	51.5	2.6	4.8	30.2	89.1
50-84	7.4	1.5	2.4	18.0	29.3
85+	2.2	.5	1.1	12.1	15.9
Total	61.1	4.6	8.3	60.3	134.3
New Mexico					
20-49	2,076.5	600.8	0	1,207.1	3,884.4
50-84	681.2	180.7	0	618.4	1,480.3
85+	60.6	10.6	0	101.6	172.8
Total	2,818.3	792.1	0	1,927.1	5,537.5
Utah					
20-49	1,910.4	224.8	0	274.2	2,409.4
50-84	342.2	113.9	0	195.6	651.7
85+	24.4	22.8	0	43.0	90.2
Total	2,277.0	361.5	0	512.8	3,151.3
Total, Southern Rocky Mountain States:					
20-49	10,711.6	2,061.0	18.4	4,469.2	17,260.2
50-84	3,976.8	896.7	3.2	1,079.4	5,956.1
85+	435.3	158.8	1.4	221.6	817.1
Total	15,123.7	3,116.5	23.0	5,770.2	24,033.4
Total, Rocky Mountain States:					
20-49	17,678.6	3,722.5	611.6	8,065.7	30,078.4
50-84	10,438.3	2,015.9	880.0	3,078.1	16,412.3
85+	8,319.0	887.5	603.9	1,210.6	11,021.0
Total	36,435.9	6,625.9	2,095.5	12,354.4	57,511.7

Table 13.--Area of commercial timberland in north Idaho by owner group, forest type, stand-size class, and productivity class, 1977

Forest type and stand-size class	National Forest						Other public					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	47.7	141.0	164.2	154.2	28.9	536.0	6.6	24.6	59.2	84.8	32.3	207.5
Poletimber	10.2	17.5	69.2	54.7	4.2	155.8	--	--	12.3	5.7	--	18.0
Sapling and seedling	17.4	22.2	99.1	13.3	19.4	171.4	--	--	25.4	5.7	6.5	37.6
Nonstocked	--	.4	45.2	--	--	45.6	--	--	--	--	9.4	9.4
Total	75.3	181.1	377.7	222.2	52.5	908.8	6.6	24.6	96.9	96.2	48.2	272.5
Hemlock:												
Sawtimber	--	47.4	120.0	32.3	15.0	214.7	--	--	26.5	--	--	26.5
Poletimber	--	41.8	4.9	20.1	5.3	72.1	--	--	--	--	5.7	5.7
Sapling and seedling	--	37.4	7.1	31.5	--	76.0	--	--	--	5.8	--	5.8
Nonstocked	--	.8	--	5.3	--	6.1	--	--	--	--	6.2	6.2
Total	--	127.4	132.0	89.2	20.3	368.9	--	--	26.5	5.8	11.9	44.2
Ponderosa pine:												
Sawtimber	1.7	7.9	41.4	24.1	11.1	86.2	--	8.9	29.5	28.9	13.7	81.0
Poletimber	--	--	.4	3.2	2.6	6.2	--	--	9.6	--	--	9.6
Sapling and seedling	--	--	.1	6.1	.1	6.3	--	--	--	7.2	--	7.2
Nonstocked	--	--	--	--	--	--	--	--	--	--	2.0	2.0
Total	1.7	7.9	41.9	33.4	13.8	98.7	--	8.9	39.1	36.1	15.7	99.8
White pine:												
Sawtimber	25.4	34.5	16.7	3.7	--	80.3	--	26.3	27.0	--	--	53.3
Poletimber	--	8.3	14.0	12.1	6.6	41.0	--	--	--	--	--	--
Sapling and seedling	--	--	1.9	--	--	1.9	--	12.3	--	--	--	12.3
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	25.4	42.8	32.6	15.8	6.6	123.2	--	38.6	27.0	--	--	65.6
Lodgepole pine:												
Sawtimber	9.3	56.3	85.5	76.9	12.4	240.4	--	--	--	--	--	--
Poletimber	2.0	53.1	100.9	79.9	47.1	283.0	--	--	--	6.5	7.3	13.8
Sapling and seedling	--	2.5	6.4	58.8	26.1	93.8	--	--	--	--	3.5	3.5
Nonstocked	--	--	--	3.8	--	3.8	--	--	--	--	--	--
Total	11.3	111.9	192.8	219.4	85.6	621.0	--	--	--	6.5	10.8	17.3
Larch:												
Sawtimber	7.8	35.5	92.0	24.4	13.7	173.4	--	11.8	--	--	--	11.8
Poletimber	.1	9.6	65.3	68.4	--	143.4	--	--	--	--	12.3	12.3
Sapling and seedling	--	24.2	52.7	73.5	6.8	157.2	--	--	--	--	--	--
Nonstocked	--	.2	.5	5.8	--	6.5	--	--	--	--	--	--
Total	7.9	69.5	210.5	172.1	20.5	480.5	--	11.8	--	--	12.3	24.1
Western redcedar:												
Sawtimber	61.3	108.7	52.5	5.9	--	228.4	--	8.6	33.2	26.0	8.6	76.4
Poletimber	--	2.7	1.3	.9	--	4.9	--	--	--	7.3	--	7.3
Sapling and seedling	--	2.0	8.4	--	--	10.4	--	--	6.5	--	--	6.5
Nonstocked	--	--	2.8	--	--	2.8	--	--	--	--	--	--
Total	61.3	113.4	65.0	6.8	--	246.5	--	8.6	39.7	33.3	8.6	90.2

Whitebark-limber pine:												
Sawtimber	--	--	.1	1.4	.2	1.7	--	--	--	--	--	--
Poletimber	--	--	--	7.8	--	7.8	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	.1	9.2	.2	9.5	--	--	--	--	--	--
True firs:												
Sawtimber	94.9	189.8	315.6	189.3	38.8	828.4	--	41.8	123.6	89.3	6.5	261.2
Poletimber	--	98.5	61.8	41.7	4.5	206.5	--	--	--	--	--	--
Sapling and seedling	6.7	97.1	37.6	26.6	7.6	175.6	--	10.2	11.2	9.1	--	30.5
Nonstocked	--	--	3.1	23.9	--	27.0	--	--	--	--	--	--
Total	101.6	385.4	418.1	281.5	50.9	1,237.5	--	52.0	134.8	98.4	6.5	291.7
Fir-spruce:												
Sawtimber	--	31.7	32.1	13.8	7.7	85.3	--	5.7	--	--	--	5.7
Poletimber	--	1.7	6.0	10.7	--	18.4	--	--	--	--	--	--
Sapling and seedling	--	.4	12.0	--	--	12.4	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	33.8	50.1	24.5	7.7	116.1	--	5.7	--	--	--	5.7
Other softwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Aspen:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Cottonwood:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Other hardwoods:												
Sawtimber	--	--	2.0	--	--	2.0	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	6.9	--	6.9
Total	--	--	2.0	--	--	2.0	--	--	--	6.9	--	6.9
All forest types:												
Sawtimber	248.1	652.8	922.1	526.0	127.8	2,476.8	6.6	127.7	299.0	229.0	61.1	723.4
Poletimber	12.3	233.2	323.8	299.5	70.3	939.1	--	--	21.9	19.5	25.3	66.7
Sapling and seedling	24.1	185.8	225.3	209.8	60.0	705.0	--	22.5	43.1	27.8	10.0	103.4
Nonstocked	--	1.4	51.6	38.8	--	91.8	--	--	--	6.9	17.6	24.5
Total	284.5	1,073.2	1,522.8	1,074.1	258.1	4,212.7	6.6	150.2	364.0	283.2	114.0	918.0

Table 13 (con.)

Forest type and stand-size class	Forest industry						Other private					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	15.4	50.2	29.3	47.0	6.2	148.1	10.7	27.8	171.4	207.7	27.8	445.4
Poletimber	--	--	--	--	6.5	6.5	--	--	--	--	6.6	6.6
Sapling and seedling	--	--	7.7	14.2	--	21.9	--	--	15.0	48.9	6.9	70.8
Nonstocked	--	--	--	19.5	--	19.5	--	--	6.9	33.5	9.0	49.4
Total	15.4	50.2	37.0	80.7	12.7	196.0	10.7	27.8	193.3	290.1	50.3	572.2
Hemlock:												
Sawtimber	--	6.1	--	6.2	6.0	18.3	--	9.3	9.0	--	20.4	38.7
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	12.4	--	--	6.5	18.9
Nonstocked	--	--	--	--	--	--	--	9.0	--	--	--	9.0
Total	--	6.1	--	6.2	6.0	18.3	--	30.7	9.0	--	26.9	66.6
Ponderosa pine:												
Sawtimber	--	8.2	1.0	25.3	.9	35.4	--	7.3	68.4	139.0	43.0	257.7
Poletimber	--	--	--	--	--	--	--	10.8	--	--	--	10.8
Sapling and seedling	--	--	--	--	6.5	6.5	--	--	--	7.7	--	7.7
Nonstocked	--	--	--	--	--	--	--	--	6.9	31.5	29.7	68.1
Total	--	8.2	1.0	25.3	7.4	41.9	--	18.1	75.3	178.2	72.7	344.3
White pine:												
Sawtimber	--	30.7	9.8	9.8	--	50.3	--	7.6	13.1	--	--	20.7
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	9.0	--	9.0
Nonstocked	--	--	--	--	--	--	--	--	--	--	6.5	6.5
Total	--	30.7	9.8	9.8	--	50.3	--	7.6	13.1	9.0	6.5	36.2
Lodgepole pine:												
Sawtimber	--	6.0	--	--	--	6.0	--	--	6.2	24.7	--	30.9
Poletimber	--	--	--	--	--	--	6.2	--	12.2	33.4	12.9	64.7
Sapling and seedling	--	--	--	--	--	--	--	--	17.6	--	19.1	36.7
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	6.0	--	--	--	6.0	6.2	--	36.0	58.1	32.0	132.3
Larch:												
Sawtimber	--	19.8	9.4	--	--	29.2	13.1	58.7	21.5	15.3	--	108.6
Poletimber	--	--	--	--	--	--	--	--	9.8	22.1	--	31.9
Sapling and seedling	--	--	--	--	--	--	--	--	8.4	16.5	--	24.9
Nonstocked	--	--	--	--	--	--	--	--	--	13.0	--	13.0
Total	--	19.8	9.4	--	--	29.2	13.1	58.7	39.7	66.9	--	178.4
Western redcedar:												
Sawtimber	15.3	6.2	28.5	35.0	22.9	107.9	6.2	15.0	32.3	38.5	8.7	100.7
Poletimber	--	--	--	--	--	--	--	--	7.3	--	6.2	13.5
Sapling and seedling	--	--	--	7.7	--	7.7	--	6.2	7.3	--	--	13.5
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	15.3	6.2	28.5	42.7	22.9	115.6	6.2	21.2	46.9	38.5	14.9	127.7

Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
True firs:												
Sawtimber	--	34.4	83.4	131.1	7.7	256.6	--	31.7	86.5	66.2	46.7	231.1
Poletimber	--	--	--	6.9	--	6.9	--	7.3	--	--	--	7.3
Sapling and seedling	--	9.9	25.3	7.7	--	42.9	--	--	--	25.8	10.3	36.1
Nonstocked	--	--	--	--	--	--	--	--	6.2	--	--	6.2
Total	--	44.3	108.7	145.7	7.7	306.4	--	39.0	92.7	92.0	57.0	280.7
Fir-spruce:												
Sawtimber	--	--	7.7	--	--	7.7	--	6.1	--	6.9	--	13.0
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	6.5	6.5
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	7.7	--	--	7.7	--	6.1	--	6.9	6.5	19.5
Other softwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Aspen:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	6.2	6.2
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	6.2	6.2
Cottonwood:												
Sawtimber	--	--	6.2	--	--	6.2	--	--	--	6.2	--	6.2
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	6.2	--	6.2
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	6.2	--	--	6.2	--	--	--	12.4	--	12.4
Other hardwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	7.3	7.3
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	24.8	24.8
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	32.1	32.1
All forest types:												
Sawtimber	30.7	161.6	175.3	254.4	43.7	665.7	30.0	163.5	408.4	504.5	153.9	1,260.3
Poletimber	--	--	--	6.9	6.5	13.4	6.2	18.1	29.3	55.5	25.7	134.8
Sapling and seedling	--	9.9	33.0	29.6	6.5	79.0	--	18.6	48.3	114.1	80.3	261.3
Nonstocked	--	--	--	19.5	--	19.5	--	9.0	20.0	78.0	45.2	152.2
Total	30.7	171.5	208.3	310.4	56.7	777.6	36.2	209.2	506.0	752.1	305.1	1,808.6

Table 14.--Area of commercial timberland in south Idaho by owner group, forest type, stand-size class, and productivity class, 1977

Forest type and stand-size class	National Forest						Other public					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	2.6	15.4	124.0	732.3	919.1	1,793.4	--	8.4	28.6	124.4	54.2	215.6
Poletimber	--	--	--	15.0	70.6	85.6	--	--	--	--	4.1	4.1
Sapling and seedling	--	2.2	--	14.1	61.3	77.6	--	3.5	1.2	--	3.0	7.7
Nonstocked	--	--	--	16.1	61.4	77.5	--	--	--	4.1	2.7	6.8
Total	2.6	17.6	124.0	777.5	1,112.4	2,034.1	--	11.9	29.8	128.5	64.0	234.2
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	--	11.8	65.7	285.5	287.8	650.8	--	2.8	25.6	54.7	13.2	96.3
Poletimber	--	.1	.6	3.6	4.0	8.3	--	--	--	3.6	--	3.6
Sapling and seedling	--	--	--	16.5	26.1	42.6	--	--	--	6.6	3.4	10.0
Nonstocked	--	--	--	8.5	42.6	51.1	--	--	--	--	3.3	3.3
Total	--	11.9	66.3	314.1	360.5	752.8	--	2.8	25.6	64.9	19.9	113.2
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	--	--	4.4	140.9	434.7	580.0	--	--	3.6	7.7	14.4	25.7
Poletimber	--	--	--	26.2	455.5	481.7	--	--	--	7.1	14.9	22.0
Sapling and seedling	--	--	--	1.9	145.7	147.6	--	--	--	--	--	--
Nonstocked	--	--	--	--	52.1	52.1	--	--	--	--	--	--
Total	--	--	4.4	169.0	1,088.0	1,261.4	--	--	3.6	14.8	29.3	47.7
Larch:												
Sawtimber	.1	.1	.5	4.2	.6	5.5	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	.6	.6	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	.1	.1	.5	4.2	1.2	6.1	--	--	--	--	--	--
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Whitebark-limber pine:												
Sawtimber	--	--	--	4.3	19.3	23.6	--	--	--	--	--	--
Poletimber	--	--	--	--	11.8	11.8	--	--	--	--	--	--
Sapling and seedling	--	--	--	1.9	4.3	6.2	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	6.2	35.4	41.6	--	--	--	--	--	--
True firs:												
Sawtimber	2.9	7.9	27.2	259.9	213.0	510.9	--	3.2	7.6	11.8	3.0	25.6
Poletimber	--	--	--	14.3	24.6	38.9	--	--	--	--	--	--
Sapling and seedling	--	--	2.1	6.8	26.4	35.3	--	--	1.5	2.8	--	4.3
Nonstocked	--	--	--	--	9.6	9.6	--	--	--	--	--	--
Total	2.9	7.9	29.3	281.0	273.6	594.7	--	3.2	9.1	14.6	3.0	29.9
Fir-spruce:												
Sawtimber	--	7.9	63.7	56.8	39.8	168.2	--	--	--	--	--	--
Poletimber	--	--	--	--	2.5	2.5	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	1.2	1.2	--	--	--	--	--	--
Nonstocked	--	--	--	--	5.0	5.0	--	--	--	--	--	--
Total	--	7.9	63.7	56.8	48.5	176.9	--	--	--	--	--	--
Other softwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Aspen:												
Sawtimber	--	--	--	6.3	16.7	23.0	--	--	--	--	--	--
Poletimber	--	--	--	3.9	21.0	24.9	--	--	--	--	8.2	8.2
Sapling and seedling	--	--	--	7.7	15.4	23.1	--	--	--	4.1	--	4.1
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	17.9	53.1	71.0	--	--	--	4.1	8.2	12.3
Cottonwood:												
Sawtimber	--	--	--	1.9	--	1.9	--	--	--	3.6	3.6	7.2
Poletimber	--	--	--	--	--	--	--	--	--	--	4.1	4.1
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	1.9	--	1.9	--	--	--	3.6	7.7	11.3
Other hardwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
All forest types:												
Sawtimber	5.6	43.1	285.5	1,492.1	1,931.0	3,757.3	--	14.4	65.4	202.2	88.4	370.4
Poletimber	--	.1	.6	63.0	590.0	653.7	--	--	--	10.7	31.3	42.0
Sapling and seedling	--	2.2	2.1	48.9	281.0	334.2	--	3.5	2.7	13.5	6.4	26.1
Nonstocked	--	--	--	24.6	170.7	195.3	--	--	--	4.1	6.0	10.1
Total	5.6	45.4	288.2	1,628.6	2,972.7	4,940.5	--	17.9	68.1	230.5	132.1	448.6

Table 14 (con.)

Forest type and stand-size class	Forest industry						Other private					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	--	4.0	13.2	44.7	17.3	79.2	--	5.6	18.3	67.7	28.3	119.9
Poletimber	--	--	--	--	.5	.5	--	--	--	--	2.5	2.5
Sapling and seedling	--	1.1	1.4	--	1.3	3.8	--	1.7	1.8	--	1.8	5.3
Nonstocked	--	--	--	.6	1.3	1.9	--	--	--	2.4	1.9	4.3
Total	--	5.1	14.6	45.3	20.4	85.4	--	7.3	20.1	70.1	34.5	132.0
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	--	1.3	9.9	21.5	5.4	38.1	--	1.8	15.4	29.7	7.4	54.3
Poletimber	--	--	--	1.3	--	1.3	--	--	--	1.8	--	1.8
Sapling and seedling	--	--	--	2.7	1.1	3.8	--	--	--	3.7	1.7	5.4
Nonstocked	--	--	--	--	1.1	1.1	--	--	--	--	1.7	1.7
Total	--	1.3	9.9	25.5	7.6	44.3	--	1.8	15.4	35.2	10.8	63.2
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	--	--	1.3	1.9	5.4	8.6	--	--	1.8	4.3	7.5	13.6
Poletimber	--	--	--	1.9	2.9	4.8	--	--	--	4.4	9.3	13.7
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	1.3	3.8	8.3	13.4	--	--	1.8	8.7	16.8	27.3
Larch:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
True firs:												
Sawtimber	--	1.4	8.1	8.0	1.3	18.8	--	1.9	11.1	11.0	1.8	25.8
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	1.1	1.4	--	2.5	--	--	1.7	1.8	--	3.5
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	1.4	9.2	9.4	1.3	21.3	--	1.9	12.8	12.8	1.8	29.3
Fir-spruce:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Other softwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Aspen:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	1.0	1.0	--	--	--	--	5.0	5.0
Sapling and seedling	--	--	--	.5	--	.5	--	--	--	2.5	--	2.5
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	.5	1.0	1.5	--	--	--	2.5	5.0	7.5
Cottonwood:												
Sawtimber	--	--	--	1.4	1.3	2.7	--	--	--	1.9	1.8	3.7
Poletimber	--	--	--	--	.5	.5	--	--	--	--	2.5	2.5
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	1.4	1.8	3.2	--	--	--	1.9	4.3	6.2
Other hardwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
All forest types:												
Sawtimber	--	6.7	32.5	77.5	30.7	147.4	--	9.3	46.6	114.6	46.8	217.3
Poletimber	--	--	--	3.2	4.9	8.1	--	--	--	6.2	19.3	25.5
Sapling and seedling	--	1.1	2.5	4.6	2.4	10.6	--	1.7	3.5	8.0	3.5	16.7
Nonstocked	--	--	--	.6	2.4	3.0	--	--	--	2.4	3.6	6.0
Total	--	7.8	35.0	85.9	40.4	169.1	--	11.0	50.1	131.2	73.2	265.5

Table 15.--Area of commercial timberland in western Montana by owner group, forest type, stand-size class, and productivity class, 1977

Forest type and stand-size class	National Forest						Other public					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	.6	378.7	781.4	243.0	44.3	1,448.0	--	--	16.3	137.5	120.0	273.8
Poletimber	--	29.0	107.5	78.0	9.0	223.5	--	--	1.6	5.2	56.6	63.4
Sapling and seedling	--	18.2	89.5	32.1	16.4	156.2	--	--	--	11.2	.5	11.7
Nonstocked	--	1.4	30.0	10.3	2.2	43.9	--	--	--	.4	1.5	1.9
Total	.6	427.3	1,008.4	363.4	71.9	1,871.6	--	--	17.9	154.3	178.6	350.8
Hemlock:												
Sawtimber	.6	41.9	23.3	13.7	.5	80.0	--	--	.5	1.0	.5	2.0
Poletimber	--	2.7	--	.1	--	2.8	--	--	--	--	--	--
Sapling and seedling	--	--	2.6	--	--	2.6	--	--	--	--	--	--
Nonstocked	--	1.0	--	--	2.1	3.1	--	--	--	--	([1])	([1])
Total	.6	45.6	25.9	13.8	2.6	88.5	--	--	.5	1.0	.5	2.0
Ponderosa pine:												
Sawtimber	--	31.0	74.7	31.5	4.2	141.4	--	--	27.7	93.1	71.0	191.8
Poletimber	--	5.4	1.0	15.7	4.4	26.5	--	--	1.7	4.5	24.3	30.5
Sapling and seedling	--	2.7	9.8	1.1	--	13.6	--	--	--	--	6.3	6.3
Nonstocked	--	--	.7	1.8	1.7	4.2	--	--	--	.2	2.9	3.1
Total	--	39.1	86.2	50.1	10.3	185.7	--	--	29.4	97.8	104.5	231.7
White pine:												
Sawtimber	1.9	6.7	23.8	.4	--	32.8	--	--	1.7	.4	--	2.1
Poletimber	--	.6	.2	--	.1	.9	--	--	--	--	--	--
Sapling and seedling	--	--	.6	--	--	.6	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	1.9	7.3	24.6	.4	.1	34.3	--	--	1.7	.4	--	2.1
Lodgepole pine:												
Sawtimber	3.9	97.0	278.0	164.4	16.8	560.1	--	--	--	4.5	8.3	12.8
Poletimber	--	81.2	503.9	339.7	68.2	993.0	--	--	--	25.8	94.9	120.7
Sapling and seedling	--	33.9	57.7	60.6	20.0	172.2	--	--	--	--	51.5	51.5
Nonstocked	--	.3	7.8	3.2	--	11.3	--	--	--	.2	([1])	.2
Total	3.9	212.4	847.4	567.9	105.0	1,736.6	--	--	--	30.5	154.7	185.2
Larch:												
Sawtimber	22.6	170.2	65.2	11.5	.7	270.2	6.4	14.0	21.2	55.9	17.6	115.1
Poletimber	2.4	33.3	57.4	--	--	93.1	--	--	--	13.7	--	13.7
Sapling and seedling	1.1	28.5	65.2	1.3	--	96.1	--	--	--	2.7	--	2.7
Nonstocked	--	6.2	3.2	--	--	9.4	--	--	--	2.7	--	2.7
Total	26.1	238.2	191.0	12.8	.7	468.8	6.4	14.0	21.2	75.0	17.6	134.2
Western redcedar:												
Sawtimber	.6	36.4	30.9	--	--	67.9	--	--	1.1	1.4	.8	3.3
Poletimber	--	--	12.1	--	--	12.1	--	--	--	--	--	--
Sapling and seedling	--	2.4	7.1	--	--	9.5	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	.6	38.8	50.1	--	--	89.5	--	--	1.1	1.4	.8	3.3

Whitebark-limber pine:												
Sawtimber	--	--	7.7	18.9	16.0	42.6	--	--	.4	.6	.1	1.1
Poletimber	--	--	--	--	9.0	9.0	--	--	.4	.5	.3	1.2
Sapling and seedling	--	--	--	--	3.9	3.9	--	--	--	1.6	--	1.6
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	7.7	18.9	28.9	55.5	--	--	.8	2.7	.4	3.9
True firs:												
Sawtimber	4.5	121.1	314.3	107.3	75.0	622.2	--	--	1.6	4.0	3.3	8.9
Poletimber	--	33.0	66.2	23.4	34.8	157.4	--	--	([1])	([1])	.1	.1
Sapling and seedling	--	11.8	115.4	16.2	15.0	158.4	--	--	.3	.5	.4	1.2
Nonstocked	--	--	7.1	1.4	--	8.5	--	--	--	--	--	--
Total	4.5	165.9	503.0	148.3	124.8	946.5	--	--	1.9	4.5	3.8	10.2
Fir-spruce:												
Sawtimber	--	41.8	46.3	18.4	.2	106.7	--	1.0	4.7	18.5	12.5	36.7
Poletimber	--	5.0	2.3	5.5	--	12.8	--	--	([1])	.1	.2	.3
Sapling and seedling	--	29.9	11.1	1.2	--	42.2	--	--	--	.3	.5	.8
Nonstocked	--	--	2.1	--	--	2.1	--	--	--	.7	2.7	3.4
Total	--	76.7	61.8	25.1	.2	163.8	--	1.0	4.7	19.6	15.9	41.2
Other softwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Aspen:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	.2	.1	.3
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	.2	.2
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	.2	.3	.5
Cottonwood:												
Sawtimber	--	--	--	--	--	--	--	--	--	.5	2.0	2.5
Poletimber	--	--	--	--	--	--	--	--	--	.1	.2	.3
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	.6	2.2	2.8
Other hardwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	([1])	.1	.1
Poletimber	--	--	--	1.1	--	1.1	--	--	--	.1	.2	.3
Sapling and seedling	--	--	--	--	--	--	--	--	--	.1	.4	.5
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	1.1	--	1.1	--	--	--	.2	.7	.9
All forest types:												
Sawtimber	34.7	924.8	1,645.6	609.1	157.7	3,371.9	6.4	15.0	75.2	317.4	236.2	650.2
Poletimber	2.4	190.2	750.6	463.5	125.5	1,532.2	--	--	3.7	50.2	176.9	230.8
Sapling and seedling	1.1	127.4	359.0	112.5	55.3	655.3	--	--	.3	16.4	59.8	76.5
Nonstocked	--	8.9	50.9	16.7	6.0	82.5	--	--	--	4.2	7.1	11.3
Total	38.2	1,251.3	2,806.1	1,201.8	344.5	5,641.9	6.4	15.0	79.2	388.2	480.0	968.8

[1]Less than 0.05 thousand acres.

Table 15 (con.)

Forest type and stand-size class	Forest industry						Other private					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	--	--	14.2	118.0	100.7	232.9	--	--	25.5	210.6	179.9	416.0
Poletimber	--	--	1.3	3.4	38.5	43.2	--	--	4.5	13.9	150.8	169.2
Sapling and seedling	--	--	--	5.4	--	5.4	--	--	--	31.7	--	31.7
Nonstocked	--	--	--	.4	1.2	1.6	--	--	--	1.1	3.9	5.0
Total	--	--	15.5	127.2	140.4	283.1	--	--	30.0	257.3	334.6	621.9
Hemlock:												
Sawtimber	--	--	.9	1.8	.8	3.5	--	--	.1	.1	([1])	.2
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	.3	.3
Total	--	--	.9	1.8	.8	3.5	--	--	.1	.1	.3	.5
Ponderosa pine:												
Sawtimber	--	--	60.3	200.4	139.4	400.1	--	--	47.0	156.6	108.8	312.4
Poletimber	--	--	1.1	3.0	14.7	18.8	--	--	3.5	9.2	46.4	59.1
Sapling and seedling	--	--	--	--	1.6	1.6	--	--	--	--	9.1	9.1
Nonstocked	--	--	--	.3	4.0	4.3	--	--	--	.4	5.8	6.2
Total	--	--	61.4	203.7	159.7	424.8	--	--	50.5	166.2	170.1	386.8
White pine:												
Sawtimber	--	--	6.2	1.5	--	7.7	--	--	([1])	([1])	--	([1])
Poletimber	--	--	4.8	1.2	--	6.0	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	.5	.5	1.0	--	--	--	--	--	--
Total	--	--	11.0	3.2	.5	14.7	--	--	([1])	([1])	--	([1])
Lodgepole pine:												
Sawtimber	--	--	--	2.1	3.4	5.5	--	--	--	13.3	22.2	35.5
Poletimber	--	--	--	17.5	64.7	82.2	--	--	--	52.6	193.4	246.0
Sapling and seedling	--	--	--	--	17.1	17.1	--	--	--	--	61.7	61.7
Nonstocked	--	--	--	1.5	.4	1.9	--	--	--	4.5	1.1	5.6
Total	--	--	--	21.1	85.6	106.7	--	--	--	70.4	278.4	348.8
Larch:												
Sawtimber	8.1	17.9	26.9	71.3	22.5	146.7	11.5	25.6	38.6	102.0	32.3	210.0
Poletimber	--	--	--	20.4	--	20.4	--	--	--	64.4	--	64.4
Sapling and seedling	--	--	--	3.4	--	3.4	--	--	--	14.3	--	14.3
Nonstocked	--	--	--	1.5	--	1.5	--	--	--	1.2	--	1.2
Total	8.1	17.9	26.9	96.6	22.5	172.0	11.5	25.6	38.6	181.9	32.3	289.9
Western redcedar:												
Sawtimber	--	--	1.6	2.0	1.1	4.7	--	--	.2	.2	.1	.5
Poletimber	--	--	--	--	--	--	--	--	.1	.1	([1])	.2
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	1.6	2.0	1.1	4.7	--	--	.3	.3	.1	.7

Whitebark-limber pine:												
Sawtimber	--	--	2.5	3.2	.8	6.5	--	--	.4	.6	.1	1.1
Poletimber	--	--	1.4	2.3	1.2	4.9	--	--	([1])	([1])	([1])	([1])
Sapling and seedling	--	--	--	6.2	--	6.2	--	--	--	--	--	--
Nonstocked	--	--	--	([1])	--	([1])	--	--	--	.2	--	.2
Total	--	--	3.9	11.7	2.0	17.6	--	--	.4	.8	.1	1.3
True firs:												
Sawtimber	--	--	--	.3	([1])	.3	--	--	.7	6.0	1.7	8.4
Poletimber	--	--	.1	.2	.2	.5	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	.1	.5	.2	.8	--	--	.7	6.0	1.7	8.4
Fir-spruce:												
Sawtimber	--	.2	1.0	3.9	2.6	7.7	--	1.2	5.4	21.1	14.2	41.9
Poletimber	--	--	([1])	.1	.4	.5	--	--	.1	1.2	4.2	5.5
Sapling and seedling	--	--	--	--	--	--	--	--	--	.1	([1])	.1
Nonstocked	--	--	--	([1])	--	([1])	--	--	--	--	.2	.2
Total	--	.2	1.0	4.0	3.0	8.2	--	1.2	5.5	22.4	18.6	47.7
Other softwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Aspen:												
Sawtimber	--	--	--	--	--	--	--	--	--	.2	.4	.6
Poletimber	--	--	--	--	--	--	--	--	--	1.1	3.0	4.1
Sapling and seedling	--	--	--	--	--	--	--	--	--	.3	.7	1.0
Nonstocked	--	--	--	([1])	.1	.1	--	--	--	.1	.1	.2
Total	--	--	--	([1])	.1	.1	--	--	--	1.7	4.2	5.9
Cottonwood:												
Sawtimber	--	--	--	.3	.7	1.0	--	--	--	7.4	19.7	27.1
Poletimber	--	--	--	--	--	--	--	--	--	.4	1.1	1.5
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	.1	.1
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	.3	.7	1.0	--	--	--	7.8	20.9	28.7
Other hardwoods:												
Sawtimber	--	--	--	.4	1.2	1.6	--	--	--	.4	1.3	1.7
Poletimber	--	--	--	.3	.8	1.1	--	--	--	.3	.8	1.1
Sapling and seedling	--	--	--	.3	.8	1.1	--	--	--	.3	.7	1.0
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	1.0	2.8	3.8	--	--	--	1.0	2.8	3.8
All forest types:												
Sawtimber	8.1	18.1	113.6	405.2	273.2	818.2	11.5	26.8	117.9	518.5	380.7	1,055.4
Poletimber	--	--	8.7	48.4	120.5	177.6	--	--	8.2	143.2	399.7	551.1
Sapling and seedling	--	--	--	15.3	19.5	34.8	--	--	--	46.7	72.3	119.0
Nonstocked	--	--	--	4.2	6.2	10.4	--	--	--	7.5	11.4	18.9
Total	8.1	18.1	122.3	473.1	419.4	1,041.0	11.5	26.8	126.1	715.9	864.1	1,744.4

[1]Less than 0.05 thousand acres.

Table 16.--Area of commercial timberland in eastern Montana by owner group, forest type, stand-size class, and productivity class, 1977

Forest type and stand-size class	National Forest						Other public					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	--	--	135.7	288.0	161.7	585.4	--	--	--	40.9	95.1	136.0
Poletimber	--	.9	2.1	61.5	20.2	84.7	--	--	--	4.7	50.6	55.3
Sapling and seedling	--	--	1.2	10.2	18.7	30.1	--	--	--	--	11.0	11.0
Nonstocked	--	--	8.9	2.2	.2	11.3	--	--	--	--	--	--
Total	--	.9	147.9	361.9	200.8	711.5	--	--	--	45.6	156.7	202.3
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	--	--	--	25.3	102.6	127.9	--	--	--	20.6	152.7	173.3
Poletimber	--	--	--	12.0	4.5	16.5	--	--	--	--	49.4	49.4
Sapling and seedling	--	--	--	3.9	5.4	9.3	--	--	--	--	33.4	33.4
Nonstocked	--	--	--	--	.6	.6	--	--	--	--	21.9	21.9
Total	--	--	--	41.2	113.1	154.3	--	--	--	20.6	257.4	278.0
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	--	--	211.4	347.6	153.6	712.6	--	--	--	9.7	31.8	41.5
Poletimber	--	--	50.0	217.9	216.8	484.7	--	--	--	11.1	44.5	55.6
Sapling and seedling	--	--	7.0	80.4	67.9	155.3	--	--	--	--	15.6	15.6
Nonstocked	--	--	--	2.6	8.2	10.8	--	--	--	--	--	--
Total	--	--	268.4	648.5	446.5	1,363.4	--	--	--	20.8	91.9	112.7
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Sawtimber	--	--	--	2.9	29.3	32.2	--	--	--	--	--	--
Poletimber	--	--	--	---	18.5	18.5	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	.6	.6	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	2.9	48.4	51.3	--	--	--	--	--	--
True firs:												
Sawtimber	--	--	13.4	68.3	38.3	120.0	--	--	--	10.9	10.2	21.1
Poletimber	--	--	.2	12.5	12.3	25.0	--	--	--	--	--	--
Sapling and seedling	--	--	7.7	28.3	7.6	43.6	--	--	--	--	--	--
Nonstocked	--	--	--	.2	--	.2	--	--	--	--	--	--
Total	--	--	21.3	109.3	58.2	188.8	--	--	--	10.9	10.2	21.1
Fir-spruce:												
Sawtimber	--	--	15.4	10.4	14.2	40.0	--	--	--	--	--	--
Poletimber	--	--	--	2.8	.8	3.6	--	--	--	--	--	--
Sapling and seedling	--	--	--	1.8	--	1.8	--	--	--	5.5	--	5.5
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	15.4	15.0	15.0	45.4	--	--	--	5.5	--	5.5
Other softwoods:												
Sawtimber	--	--	--	--	.1	.1	--	--	--	4.9	--	4.9
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	.1	.1	--	--	--	4.9	--	4.9
Aspen:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	4.7	--	4.7
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	5.7	5.7
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	4.7	5.7	10.4
Cottonwood:												
Sawtimber	--	--	--	--	--	--	--	--	--	4.7	23.8	28.5
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	4.7	23.8	28.5
Other hardwoods:												
Sawtimber	--	--	--	1.7	3.4	5.1	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	1.7	3.4	5.1	--	--	--	--	--	--
All forest types:												
Sawtimber	--	--	375.9	744.2	503.2	1,623.3	--	--	--	91.7	313.6	405.3
Poletimber	--	.9	52.3	306.7	273.1	633.0	--	--	--	20.5	144.5	165.0
Sapling and seedling	--	--	15.9	124.6	100.2	240.7	--	--	--	5.5	65.7	71.2
Nonstocked	--	--	8.9	5.0	9.0	22.9	--	--	--	--	21.9	21.9
Total	--	.9	453.0	1,180.5	885.5	2,519.9	--	--	--	117.7	545.7	663.4

Table 16 (con.)

Forest type and stand-size class	Forest industry						Other private					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	--	--	--	--	1.2	1.2	--	--	--	111.5	252.6	364.1
Poletimber	--	--	--	--	1.2	1.2	--	--	--	12.5	135.4	147.9
Sapling and seedling	--	--	--	--	.8	.8	--	--	--	--	28.6	28.6
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	3.2	3.2	--	--	--	124.0	416.6	540.6
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	--	--	--	--	3.8	3.8	--	--	--	55.0	402.1	457.1
Poletimber	--	--	--	--	1.5	1.5	--	--	--	--	129.8	129.8
Sapling and seedling	--	--	--	--	1.5	1.5	--	--	--	--	87.4	87.4
Nonstocked	--	--	--	--	1.6	1.6	--	--	--	--	57.4	57.4
Total	--	--	--	--	8.4	8.4	--	--	--	55.0	676.7	731.7
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	--	--	--	--	.4	.4	--	--	--	27.5	89.3	116.8
Poletimber	--	--	--	.4	.4	.8	--	--	--	29.3	119.2	148.5
Sapling and seedling	--	--	--	--	.8	.8	--	--	--	--	41.2	41.2
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	.4	1.6	2.0	--	--	--	56.8	249.7	306.5
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
True firs:												
Sawtimber	--	--	--	--	.4	.4	--	--	--	28.3	26.8	55.1
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	.4	.4	--	--	--	28.3	26.8	55.1
Fir-spruce:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	.4	--	.4	--	--	--	14.4	--	14.4
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	.4	--	.4	--	--	--	14.4	--	14.4
Other softwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	12.5	--	12.5
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	12.5	--	12.5
Aspen:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	12.5	--	12.5
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	14.9	14.9
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	12.5	14.9	27.4
Cottonwood:												
Sawtimber	--	--	--	--	--	--	--	--	--	12.5	64.9	77.4
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	12.5	64.9	77.4
Other hardwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
All forest types:												
Sawtimber	--	--	--	--	5.8	5.8	--	--	--	247.3	835.7	1,083.0
Poletimber	--	--	--	.4	3.1	3.5	--	--	--	54.3	384.4	438.7
Sapling and seedling	--	--	--	.4	3.1	3.5	--	--	--	14.4	172.1	186.5
Nonstocked	--	--	--	--	1.6	1.6	--	--	--	--	57.4	57.4
Total	--	--	--	.8	13.6	14.4	--	--	--	316.0	1,449.6	1,765.6

Table 17.--Area of commercial timberland in western South Dakota by owner group, forest type, stand-size class, and productivity class, 1977

Forest type and stand-size class	National Forest						Other public					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	--	--	2.6	83.8	556.6	643.0	--	--	--	3.4	40.9	44.3
Poletimber	--	--	--	1.7	232.6	234.3	--	--	--	.5	11.0	11.5
Sapling and seedling	--	--	--	.9	34.4	35.3	--	--	--	.2	14.3	14.5
Nonstocked	--	--	--	([1])	2.0	2.0	--	--	--	.1	1.4	1.5
Total	--	--	2.6	86.4	825.6	914.6	--	--	--	4.2	67.6	71.8
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Whitebark-limber pine:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
True firs:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Fir-spruce:												
Sawtimber	--	--	2.5	13.6	2.3	18.4	--	--	--	.2	.5	.7
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	2.5	13.6	2.3	18.4	--	--	--	.2	.5	.7
Other softwoods:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Aspen:												
Sawtimber	--	--	--	4.7	8.8	13.5	--	--	-	([1])	.1	.1
Poletimber	--	--	--	--	4.0	4.0	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	2.0	2.0	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	4.7	14.8	19.5	--	--	--	([1])	.1	.1
Cottonwood:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Other hardwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	.5	2.2	2.7
Poletimber	--	--	--	--	--	--	--	--	--	.1	.4	.5
Sapling and seedling	--	--	--	--	--	--	--	--	--	.1	.3	.4
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	.7	2.9	3.6
All forest types:												
Sawtimber	--	--	5.1	102.1	567.7	674.9	--	--	--	4.1	43.7	47.8
Poletimber	--	--	--	1.7	236.6	238.3	--	--	--	.6	11.4	12.0
Sapling and seedling	--	--	--	.9	36.4	37.3	--	--	--	.3	14.6	14.9
Nonstocked	--	--	--	([1])	2.0	2.0	--	--	--	.1	1.4	1.5
Total	--	--	5.1	104.7	842.7	952.5	--	--	--	5.1	71.1	76.2

[1]Less than 0.05 thousand acres.

Table 17 (con.)

Forest type and stand-size class	Forest industry						Other private					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	--	--	--	1.3	5.0	6.3	--	--	--	10.6	79.8	90.4
Poletimber	--	--	--	.5	3.6	4.1	--	--	--	3.5	44.9	48.4
Sapling and seedling	--	--	--	.1	1.1	1.2	--	--	--	2.5	26.3	28.8
Nonstocked	--	--	--	--	--	--	--	--	--	.5	4.4	4.9
Total	--	--	--	1.9	9.7	11.6	--	--	--	17.1	155.4	172.5
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Whitebark-limber pine:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
True firs:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Fir-spruce:												
Sawtimber	--	--	--	.2	.5	.7	--	--	--	1.9	2.6	4.5
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	.2	.5	.7	--	--	--	1.9	2.6	4.5
Other softwoods:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Aspen:												
Sawtimber	--	--	--	([1])	.1	.1	--	--	--	.6	.4	1.0
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	([1])	.1	.1	--	--	--	.6	.4	1.0
Cottonwood:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Other hardwoods:												
Sawtimber	--	--	--	.6	2.2	2.8	--	--	--	3.1	13.5	16.6
Poletimber	--	--	--	.1	.3	.4	--	--	--	.4	1.6	2.0
Sapling and seedling	--	--	--	.1	.4	.5	--	--	--	.4	2.3	2.7
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	.8	2.9	3.7	--	--	--	3.9	17.4	21.3
All forest types:												
Sawtimber	--	--	--	2.1	7.8	9.9	--	--	--	16.2	96.3	112.5
Poletimber	--	--	--	.6	3.9	4.5	--	--	--	3.9	46.5	50.4
Sapling and seedling	--	--	--	.2	1.5	1.7	--	--	--	2.9	28.6	31.5
Nonstocked	--	--	--	--	--	--	--	--	--	.5	4.4	4.9
Total	--	--	--	2.9	13.2	16.1	--	--	--	23.5	175.8	199.3

[1]Less than 0.05 thousand acres.

Table 18.--Area of commercial timberland in Wyoming by owner group, forest type, stand-size class, and productivity class, 1977

Forest type and stand-size class	National Forest						Other public					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	--	--	10.4	248.0	41.6	300.0	--	--	10.7	36.5	21.8	69.0
Poletimber	--	--	--	62.5	9.7	72.2	--	--	--	3.0	9.4	12.4
Sapling and seedling	--	--	--	.4	6.6	7.0	--	--	--	--	3.1	3.1
Nonstocked	--	--	--	1.5	19.4	20.9	--	--	--	--	8.2	8.2
Total	--	--	10.4	312.4	77.3	400.1	--	--	10.7	39.5	42.5	92.7
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	--	--	0.3	14.3	138.6	153.2	--	--	--	--	102.1	102.1
Poletimber	--	--	--	--	47.4	47.4	--	--	.1	1.5	34.1	35.7
Sapling and seedling	--	--	--	--	5.4	5.4	--	--	--	--	8.0	8.0
Nonstocked	--	--	--	--	29.1	29.1	--	--	--	--	10.6	10.6
Total	--	--	0.3	14.3	220.5	235.1	--	--	.1	1.5	154.8	156.4
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	--	--	12.2	232.8	439.3	684.3	--	--	1.4	10.0	42.7	54.1
Poletimber	--	--	4.0	68.1	315.3	387.4	--	--	.1	1.2	17.3	18.6
Sapling and seedling	--	--	--	9.2	156.1	165.3	--	--	--	--	3.8	3.8
Nonstocked	--	--	13.8	1.4	30.8	46.0	--	--	--	--	5.6	5.6
Total	--	--	30.0	311.5	941.5	1,283.0	--	--	1.5	11.2	69.4	82.1
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Whitebark-limber pine:												
Sawtimber	--	--	--	22.5	53.3	75.8	--	--	--	.1	1.2	1.3
Poletimber	--	--	--	--	39.4	39.4	--	--	--	--	.8	.8
Sapling and seedling	--	--	--	.2	.7	.9	--	--	--	--	.2	.2
Nonstocked	--	--	--	--	6.7	6.7	--	--	--	--	.1	.1
Total	--	--	--	22.7	100.1	122.8	--	--	--	.1	2.3	2.4
True firs:												
Sawtimber	--	--	12.0	157.5	15.5	185.0	--	--	--	--	--	--
Poletimber	--	--	--	9.6	5.2	14.8	--	--	--	--	--	--
Sapling and seedling	--	--	.2	20.6	2.6	23.4	--	--	--	--	--	--
Nonstocked	--	--	2.3	--	4.5	6.8	--	--	--	--	--	--
Total	--	--	14.5	187.7	27.8	230.0	--	--	--	--	--	--
Fir-spruce:												
Sawtimber	--	--	54.2	322.4	153.3	529.9	--	--	2.6	35.2	4.0	41.8
Poletimber	--	--	--	43.4	20.1	63.5	--	--	6.3	6.3	.5	13.1
Sapling and seedling	--	--	--	16.6	47.0	63.6	--	--	--	--	2.2	2.2
Nonstocked	--	--	--	--	19.7	19.7	--	--	--	--	6.3	6.3
Total	--	--	54.2	382.4	240.1	676.7	--	--	8.9	41.5	13.0	63.4
Other softwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	4.9	4.9	--	--	--	--	--	--
Total	--	--	--	--	4.9	4.9	--	--	--	--	--	--
Aspen:												
Sawtimber	--	--	--	4.2	14.7	18.9	--	--	.1	.7	13.7	14.5
Poletimber	--	--	--	2.6	15.7	18.3	--	--	--	--	18.3	18.3
Sapling and seedling	--	--	--	25.2	5.8	31.0	--	--	--	--	3.3	3.3
Nonstocked	--	--	--	8.6	15.1	23.7	--	--	--	--	--	--
Total	--	--	--	40.6	51.3	91.9	--	--	.1	.7	35.3	36.1
Cottonwood:												
Sawtimber	--	--	--	.2	--	.2	--	--	--	--	.2	.2
Poletimber	--	--	--	--	--	--	--	--	--	--	.2	.2
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	.1	.1
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	.2	--	.2	--	--	--	--	.5	.5
Other hardwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	.6	.6
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	.2	.2
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	.8	.8
All forest types:												
Sawtimber	--	--	89.1	1,001.9	856.3	1,947.3	--	--	14.8	82.5	185.7	283.0
Poletimber	--	--	4.0	186.2	452.8	643.0	--	--	6.5	12.0	81.2	99.7
Sapling and seedling	--	--	.2	72.2	224.2	296.6	--	--	--	--	20.9	20.9
Nonstocked	--	--	16.1	11.5	130.2	157.8	--	--	--	--	30.8	30.8
Total	--	--	109.4	1,271.8	1,663.5	3,044.7	--	--	21.3	94.5	318.6	434.4

Table 18 (con.)

Forest type and stand-size class	Forest industry						Other private					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	--	--	.4	1.6	.9	2.9	--	--	7.1	24.2	14.5	45.8
Poletimber	--	--	--	.2	.6	.8	--	--	--	3.1	9.8	12.9
Sapling and seedling	--	--	--	--	.1	.1	--	--	--	--	1.7	1.7
Nonstocked	--	--	--	--	.1	.1	--	--	--	--	1.3	1.3
Total	--	--	.4	1.8	1.7	3.9	--	--	7.1	27.3	27.3	61.7
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	--	--	--	--	29.4	29.4	--	--	--	--	367.7	367.7
Poletimber	--	--	--	.3	6.4	6.7	--	--	.5	5.0	108.7	114.2
Sapling and seedling	--	--	--	--	.8	.8	--	--	--	--	12.5	12.5
Nonstocked	--	--	--	--	.6	.6	--	--	--	--	9.3	9.3
Total	--	--	--	.3	37.2	37.5	--	--	.5	5.0	498.2	503.7
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	--	--	.1	.7	2.9	3.7	--	--	1.4	10.3	45.4	57.1
Poletimber	--	--	--	.1	1.4	1.5	--	--	.2	1.9	29.6	31.7
Sapling and seedling	--	--	--	--	.2	.2	--	--	--	--	5.9	5.9
Nonstocked	--	--	--	--	.1	.1	--	--	--	--	1.4	1.4
Total	--	--	.1	.8	4.6	5.5	--	--	1.6	12.2	82.3	96.1
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Whitebark-limber pine:												
Sawtimber	--	--	--	--	.7	.7	--	--	.1	.6	11.0	11.7
Poletimber	--	--	--	--	.2	.2	--	--	--	.2	5.0	5.2
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	.6	.6
Nonstocked	--	--	--	--	--	--	--	--	--	--	.3	.3
Total	--	--	--	--	.9	.9	--	--	.1	.8	16.9	17.8
True firs:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Fir-spruce:												
Sawtimber	--	--	.1	.7	.7	1.5	--	--	1.0	11.4	7.0	19.4
Poletimber	--	--	.1	.1	.4	.6	--	--	1.5	1.7	4.4	7.6
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	.8	.8
Nonstocked	--	--	--	--	--	--	--	--	--	--	.8	.8
Total	--	--	.2	.8	1.1	2.1	--	--	2.5	13.1	13.0	28.6
Other softwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Aspen:												
Sawtimber	--	--	--	--	--	--	--	--	.3	1.6	32.2	34.1
Poletimber	--	--	--	--	3.6	3.6	--	--	--	--	39.6	39.6
Sapling and seedling	--	--	--	--	.3	.3	--	--	--	--	4.7	4.7
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	3.9	3.9	--	--	.3	1.6	76.5	78.4
Cottonwood:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	1.9	1.9
Poletimber	--	--	--	--	--	--	--	--	--	--	1.3	1.3
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	.1	.1
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	3.3	3.3
Other hardwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	.5	.5	--	--	--	--	10.9	10.9
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	.3	.3
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	.5	.5	--	--	--	--	11.2	11.2
All forest types:												
Sawtimber	--	--	.6	3.0	34.6	38.2	--	--	9.9	48.1	479.7	537.7
Poletimber	--	--	.1	.7	13.1	13.9	--	--	2.2	11.9	209.3	223.4
Sapling and seedling	--	--	--	--	1.4	1.4	--	--	--	--	26.6	26.6
Nonstocked	--	--	--	--	.8	.8	--	--	--	--	13.1	13.1
Total	--	--	.7	3.7	49.9	54.3	--	--	12.1	60.0	728.7	800.8

Table 19.--Area of commercial timberland in Arizona by owner group, forest type, stand-size class, and productivity class, 1977

Forest type and stand-size class	National Forest						Other public					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	--	1.6	18.0	87.5	64.4	171.5	--	--	3.7	1.8	--	5.5
Poletimber	--	--	.7	3.1	--	3.8	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	.2	.2	--	--	--	--	--	--
Nonstocked	--	--	--	--	5.0	5.0	--	--	--	--	--	--
Total	--	1.6	18.7	90.6	69.6	180.5	--	--	3.7	1.8	--	5.5
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	--	7.0	9.1	392.7	1,363.5	1,772.3	--	--	105.8	494.4	529.8	1,130.0
Poletimber	--	--	--	13.1	149.6	162.7	--	--	--	2.0	--	2.0
Sapling and seedling	--	--	--	6.6	96.6	103.2	--	--	--	3.1	.8	3.9
Nonstocked	--	--	--	8.0	103.6	111.6	--	--	--	--	4.2	4.2
Total	--	7.0	9.1	420.4	1,713.3	2,149.8	--	--	105.8	499.5	534.8	1,140.1
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Whitebark-limber pine:												
Sawtimber	--	--	.2	--	5.7	5.9	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	.2	--	5.7	5.9	--	--	--	--	--	--
True firs:												
Sawtimber	--	.2	14.4	19.0	8.3	41.9	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	.2	14.4	19.0	8.3	41.9	--	--	--	--	--	--
Fir-spruce:												
Sawtimber	--	--	8.5	3.1	2.2	13.8	--	--	--	50.6	50.5	101.1
Poletimber	--	--	--	--	2.3	2.3	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	.4	.4	--	--	--	--	--	--
Total	--	--	8.5	3.1	4.9	16.5	--	--	--	50.6	50.5	101.1
Other softwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Aspen:												
Sawtimber	--	--	.5	14.8	11.0	26.3	--	--	--	--	--	--
Poletimber	--	--	.7	1.8	4.7	7.2	--	--	--	--	21.1	21.1
Sapling and seedling	--	--	--	3.9	29.5	33.4	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	1.2	20.5	45.2	66.9	--	--	--	--	21.1	21.1
Cottonwood:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Other hardwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
All forest types:												
Sawtimber	--	8.8	50.7	517.1	1,455.1	2,031.7	--	--	109.5	546.8	580.3	1,236.6
Poletimber	--	--	1.4	18.0	156.6	176.0	--	--	--	2.0	21.1	23.1
Sapling and seedling	--	--	--	10.5	126.3	136.8	--	--	--	3.1	.8	3.9
Nonstocked	--	--	--	8.0	109.0	117.0	--	--	--	--	4.2	4.2
Total	--	8.8	52.1	553.6	1,847.0	2,461.5	--	--	109.5	551.9	606.4	1,267.8

Table 19 (con.)

Forest type and stand-size class	Forest industry						Other private					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	0	0	0	0	0	0	--	--	--	--	--	--
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	--	--
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	--	--	--	--
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	0	0	0	0	0	0	--	--	--	71.9	47.9	119.8
Poletimber	0	0	0	0	0	0	--	--	1.4	--	6.0	7.4
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	15.0	15.0
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	1.4	71.9	68.9	142.2
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Whitebark-limber pine:												
Sawtimber	0	0	0	0	0	0	--	--	--	--	--	--
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	--	--
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	--	--	--	--
True firs:												
Sawtimber	0	0	0	0	0	0	--	--	--	--	--	--
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	--	--
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	--	--	--	--
Fir-spruce:												
Sawtimber	0	0	0	0	0	0	--	--	--	--	--	--
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	--	--
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	--	--	--	--
Other softwoods:												
Sawtimber	0	0	0	0	0	0	--	--	--	--	--	--
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	--	--
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	--	--	--	--
Aspen:												
Sawtimber	0	0	0	0	0	0	--	--	1.2	7.0	7.1	15.3
Poletimber	0	0	0	0	0	0	--	--	--	--	6.6	6.6
Sapling and seedling	0	0	0	0	0	0	--	--	--	1.8	.4	2.2
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	1.2	8.8	14.1	24.1
Cottonwood:												
Sawtimber	0	0	0	0	0	0	--	--	--	--	--	--
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	--	--
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	--	--	--	--
Other hardwoods:												
Sawtimber	0	0	0	0	0	0	--	--	--	--	--	--
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	--	--
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	--	--	--	--
All forest types:												
Sawtimber	0	0	0	0	0	0	--	--	1.2	78.9	55.0	135.1
Poletimber	0	0	0	0	0	0	--	--	1.4	--	12.6	14.0
Sapling and seedling	0	0	0	0	0	0	--	--	--	1.8	15.4	17.2
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	2.6	80.7	83.0	166.3

Table 20.--Area of commercial timberland in Colorado by owner group, forest type, stand-size class, and productivity class, 1977

Forest type and stand-size class	National Forest						Other public					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	--	--	7.2	247.3	243.1	497.6	--	--	--	27.0	89.7	116.7
Poletimber	--	--	--	87.0	83.7	170.7	--	--	2.3	--	49.9	52.2
Sapling and seedling	--	--	--	8.7	2.8	11.5	--	--	--	--	.3	.3
Nonstocked	--	--	--	13.8	36.9	50.7	--	--	--	--	2.0	2.0
Total	--	--	7.2	356.8	366.5	730.5	--	--	2.3	27.0	141.9	171.2
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	--	--	--	69.1	463.2	532.3	--	--	--	4.0	150.1	154.1
Poletimber	--	--	--	18.0	82.6	100.6	--	--	--	--	36.1	36.1
Sapling and seedling	--	--	--	.4	10.3	10.7	--	--	--	--	.1	.1
Nonstocked	--	--	--	22.5	286.1	308.6	--	--	--	--	.2	.2
Total	--	--	--	110.0	842.2	952.2	--	--	--	4.0	186.5	190.5
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	--	--	9.1	75.8	520.5	605.4	--	--	--	--	24.1	24.1
Poletimber	--	--	--	27.5	409.5	437.0	--	--	--	.7	63.5	64.2
Sapling and seedling	--	--	--	13.3	176.3	189.6	--	--	--	--	4.5	4.5
Nonstocked	--	--	--	--	38.1	38.1	--	--	--	--	.5	.5
Total	--	--	9.1	116.6	1,144.4	1,270.1	--	--	--	.7	92.6	93.3
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Whitebark-limber pine:												
Sawtimber	--	--	--	--	19.4	19.4	--	--	--	.6	4.1	4.7
Poletimber	--	--	--	--	--	--	--	--	--	.1	2.1	2.2
Sapling and seedling	--	--	--	--	1.2	1.2	--	--	--	--	.2	.2
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	20.6	20.6	--	--	--	.7	6.4	7.1
True firs:												
Sawtimber	--	--	--	.1	.1	.2	--	--	--	--	1.3	1.3
Poletimber	--	--	--	2.7	3.6	6.3	--	--	--	--	1.0	1.0
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	2.8	3.7	6.5	--	--	--	--	2.3	2.3
Fir-spruce:												
Sawtimber	--	2.3	177.4	953.6	776.6	1,909.9	--	--	7.8	13.2	30.1	51.1
Poletimber	--	--	.4	119.4	139.3	259.1	--	--	.5	1.6	3.5	5.6
Sapling and seedling	--	--	24.9	112.6	91.2	228.7	--	--	--	--	.4	.4
Nonstocked	--	--	14.0	57.6	115.5	187.1	--	--	--	--	3.3	3.3
Total	--	2.3	216.7	1,243.2	1,122.6	2,584.8	--	--	8.3	14.8	37.3	60.4
Other softwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Aspen:												
Sawtimber	--	--	38.7	203.5	336.9	579.1	--	1.6	3.2	1.5	15.8	22.1
Poletimber	--	--	11.0	241.9	491.5	744.4	--	--	--	--	112.0	112.0
Sapling and seedling	--	--	--	53.5	201.3	254.8	--	--	--	--	12.8	12.8
Nonstocked	--	--	2.2	64.1	296.5	362.8	--	--	--	--	.2	.2
Total	--	--	51.9	563.0	1,326.2	1,941.1	--	1.6	3.2	1.5	140.8	147.1
Cottonwood:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	18.1	18.1
Poletimber	--	--	--	--	--	--	--	--	--	--	.3	.3
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	.2	.2
Total	--	--	--	--	--	--	--	--	--	--	18.6	18.6
Other hardwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
All forest types:												
Sawtimber	--	2.3	232.4	1,549.4	2,359.8	4,143.9	--	1.6	11.0	46.3	333.3	392.2
Poletimber	--	--	11.4	496.5	1,210.2	1,718.1	--	--	2.8	2.4	268.4	273.6
Sapling and seedling	--	--	24.9	188.5	483.1	696.5	--	--	--	--	18.3	18.3
Nonstocked	--	--	16.2	158.0	773.1	947.3	--	--	--	--	6.4	6.4
Total	--	2.3	284.9	2,392.4	4,826.2	7,505.8	--	1.6	13.8	48.7	626.4	690.5

Table 20 (con.)

Forest type and stand-size class	Forest industry						Other private					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	--	--	--	--	--	--	--	--	--	62.2	206.5	268.7
Poletimber	--	--	--	--	--	--	--	--	5.4	--	116.9	122.3
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	2.0	2.0
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	5.4	62.2	325.4	393.0
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	--	--	--	--	--	--	--	--	--	13.7	525.4	539.1
Poletimber	--	--	--	--	--	--	--	--	--	--	367.2	367.2
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	.3	.3
Nonstocked	--	--	--	--	--	--	--	--	--	--	255.1	255.1
Total	--	--	--	--	--	--	--	--	--	13.7	1,148.0	1,161.7
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	--	--	--	--	1.7	1.7	--	--	--	--	71.9	71.9
Poletimber	--	--	--	.1	9.9	10.0	--	--	--	3.2	264.1	267.3
Sapling and seedling	--	--	--	--	.4	.4	--	--	--	--	20.6	20.6
Nonstocked	--	--	--	--	--	--	--	--	--	--	1.4	1.4
Total	--	--	--	.1	12.0	12.1	--	--	--	3.2	358.0	361.2
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Whitebark-limber pine:												
Sawtimber	--	--	--	--	--	--	--	--	--	1.9	13.0	14.9
Poletimber	--	--	--	--	--	--	--	--	--	1.0	23.9	24.9
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	.6	.6
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	2.9	37.5	40.4
True firs:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	1.6	1.6
Poletimber	--	--	--	--	--	--	--	--	--	--	4.9	4.9
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	6.5	6.5
Fir-spruce:												
Sawtimber	--	--	.3	.6	1.3	2.2	--	--	38.8	66.4	150.5	255.7
Poletimber	--	--	--	.1	.2	.3	--	--	4.4	14.2	32.9	51.5
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	1.5	1.5
Nonstocked	--	--	--	--	--	--	--	--	--	--	7.0	7.0
Total	--	--	.3	.7	1.5	2.5	--	--	43.2	80.6	191.9	315.7
Other softwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Aspen:												
Sawtimber	--	--	--	--	.1	.1	--	4.6	9.1	4.1	45.0	62.8
Poletimber	--	--	--	--	--	--	--	--	--	--	591.3	591.3
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	110.9	110.9
Nonstocked	--	--	--	--	--	--	--	--	--	--	.4	.4
Total	--	--	--	--	.1	.1	--	4.6	9.1	4.1	747.6	765.4
Cottonwood:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	56.3	56.3
Poletimber	--	--	--	--	--	--	--	--	--	--	3.2	3.2
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	.3	.3
Total	--	--	--	--	--	--	--	--	--	--	59.8	59.8
Other hardwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
All forest types:												
Sawtimber	--	--	.3	.6	3.1	4.0	--	4.6	47.9	148.3	1,070.2	1,271.0
Poletimber	--	--	--	.2	10.1	10.3	--	--	9.8	18.4	1,404.4	1,432.6
Sapling and seedling	--	--	--	--	.4	.4	--	--	--	--	135.9	135.9
Nonstocked	--	--	--	--	--	--	--	--	--	--	264.2	264.2
Total	--	--	.3	.8	13.6	14.7	--	4.6	57.7	166.7	2,874.7	3,103.7

Table 21.--Area of commercial timberland in Nevada by owner group, forest type, stand-size class, and productivity class, 1977

Forest type and stand-size class	National Forest						Other public					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	2.9	2.9	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	2.9	2.9	--	--	--	--	--	--
Hemlock:												
Sawtimber	--	--	--	--	1.6	1.6	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	1.6	1.6	--	--	--	--	--	--
Ponderosa pine:												
Sawtimber	--	--	1.1	3.9	13.7	18.7	--	--	--	1.0	1.7	2.7
Poletimber	--	--	--	(1)	.4	.4	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	.1	.1
Nonstocked	--	.2	.2	1.4	2.8	4.6	--	--	--	--	.1	.1
Total	--	.2	1.3	5.3	16.9	23.7	--	--	--	1.0	1.9	2.9
White pine:												
Sawtimber	--	--	--	.7	--	.7	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	.7	--	.7	--	--	--	--	--	--
Lodgepole pine:												
Sawtimber	--	--	--	--	3.6	3.6	--	--	--	.1	.1	.2
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	3.6	3.6	--	--	--	.1	.1	.2
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Whitebark-limber pine:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	4.8	4.8	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	4.8	4.8	--	--	--	--	--	--
True firs:												
Sawtimber	--	--	([1])	1.0	3.6	4.6	--	.1	.4	.4	.6	1.5
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	.6	.6	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	([1])	1.0	4.2	5.2	--	.1	.4	.4	.6	1.5
Fir-spruce:												
Sawtimber	--	--	--	--	10.2	10.2	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	10.2	10.2	--	--	--	--	--	--
Other softwoods:												
Sawtimber	--	.1	.6	.4	.1	1.2	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	([1])	([1])	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	.1	.6	.4	.1	1.2	--	--	--	--	--	--
Aspen:												
Sawtimber	--	--	--	--	6.5	6.5	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	6.5	6.5	--	--	--	--	--	--
Cottonwood:												
Sawtimber	--	--	--	--	.7	.7	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	.7	.7	--	--	--	--	--	--
Other hardwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
All forest types:												
Sawtimber	--	.1	1.7	6.0	40.0	47.8	--	.1	.4	1.5	2.4	4.4
Poletimber	--	--	--	([1])	3.3	3.3	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	5.4	5.4	--	--	--	--	.1	.1
Nonstocked	--	.2	.2	1.4	2.8	4.6	--	--	--	--	.1	.1
Total	--	.3	1.9	7.4	51.5	61.1	--	.1	.4	1.5	2.6	4.6

[1]Less than 0.05 thousand acres.

Table 21 (con.)

Forest type and stand-size class	Forest industry						Other private					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas fir:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Hemlock:												
Sawtimber	--	--	--	--	.1	.1	--	--	--	--	.7	.7
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	.1	.1	--	--	--	--	.7	.7
Ponderosa pine:												
Sawtimber	--	--	.1	1.4	2.5	4.0	--	--	.9	10.4	15.9	27.2
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	.3	.3	--	--	--	--	1.4	1.4
Nonstocked	--	--	--	--	.1	.1	--	--	--	--	.7	.7
Total	--	--	.1	1.4	2.9	4.4	--	--	.9	10.4	18.0	29.3
White pine:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole pine:												
Sawtimber	--	--	--	.1	.5	.6	--	--	--	.7	3.2	3.9
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	.1	.5	.6	--	--	--	.7	3.2	3.9
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Whitebark-limber pine:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
True firs:												
Sawtimber	--	.3	.7	.9	.9	2.8	--	2.2	9.0	6.9	6.9	25.0
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	.4	.4	--	--	--	--	1.4	1.4
Total	--	.3	.7	.9	1.3	3.2	--	2.2	9.0	6.9	8.3	26.4
Fir-spruce:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Other softwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Aspen:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Cottonwood:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Other hardwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
All forest types:												
Sawtimber	--	.3	.8	2.4	4.0	7.5	--	2.2	9.9	18.0	26.7	56.8
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	.3	.3	--	--	--	--	1.4	1.4
Nonstocked	--	--	--	--	.5	.5	--	--	--	--	2.1	2.1
Total	--	.3	.8	2.4	4.8	8.3	--	2.2	9.9	18.0	30.2	60.3

Table 22.--Area of commercial timberland in New Mexico by owner group, forest type, stand-size class, and productivity class, 1977

Forest type and stand-size class	National Forest						Other public					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	--	--	22.2	155.2	270.4	447.8	--	--	--	19.3	43.0	62.3
Poletimber	--	--	--	6.3	15.2	21.5	--	--	--	--	7.1	7.1
Sapling and seedling	--	--	--	3.9	14.5	18.4	--	--	--	--	--	--
Nonstocked	--	--	--	7.1	14.7	21.8	--	--	--	--	--	--
Total	--	--	22.2	172.5	314.8	509.5	--	--	--	19.3	50.1	69.4
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	--	--	7.9	211.3	1,203.4	1,422.6	--	--	--	116.5	530.8	647.3
Poletimber	--	--	1.1	13.9	95.7	110.7	--	--	--	--	5.6	5.6
Sapling and seedling	--	--	--	14.6	114.4	129.0	--	4.0	--	4.0	4.0	12.0
Nonstocked	--	--	--	12.0	135.4	147.4	--	--	--	--	3.0	3.0
Total	--	--	9.0	251.8	1,548.9	1,809.7	--	4.0	-	120.5	543.4	667.9
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Whitebark-limber pine:												
Sawtimber	--	--	--	4.9	7.3	12.2	--	--	.2	1.3	3.2	4.7
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	1.5	1.5	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	4.9	8.8	13.7	--	--	.2	1.3	3.2	4.7
True firs:												
Sawtimber	--	--	16.9	115.1	76.6	208.6	--	--	--	--	--	--
Poletimber	--	--	--	14.4	4.9	19.3	--	--	--	--	--	--
Sapling and seedling	--	--	--	4.2	5.4	9.6	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	16.9	133.7	86.9	237.5	--	--	--	--	--	--
Fir-spruce:												
Sawtimber	--	--	3.3	56.2	7.3	66.8	--	--	--	31.3	--	31.3
Poletimber	--	--	--	--	1.5	1.5	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	1.5	--	1.5	1.7	4.7
Nonstocked	--	--	--	--	32.4	32.4	--	--	--	--	--	--
Total	--	--	3.3	56.2	41.2	100.7	--	1.5	--	32.8	1.7	36.0
Other softwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Aspen:												
Sawtimber	--	--	2.1	23.1	22.0	47.2	--	--	4.4	4.3	--	8.7
Poletimber	--	--	4.2	36.1	46.1	86.4	--	--	--	2.0	2.1	4.1
Sapling and seedling	--	--	2.9	2.9	7.8	13.6	--	.5	--	.5	.3	1.3
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	9.2	62.1	75.9	147.2	--	.5	4.4	6.8	2.4	14.1
Cottonwood:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Other hardwoods:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
All forest types:												
Sawtimber	--	--	52.4	565.8	1,587.0	2,205.2	--	--	4.6	172.7	577.0	754.3
Poletimber	--	--	5.3	70.7	163.4	239.4	--	--	--	2.0	14.8	16.8
Sapling and seedling	--	--	2.9	25.6	143.6	172.1	--	6.0	--	6.0	6.0	18.0
Nonstocked	--	--	--	19.1	182.5	201.6	--	--	--	--	3.0	3.0
Total	--	--	60.6	681.2	2,076.5	2,818.3	--	6.0	4.6	180.7	600.8	792.1

Table 22 (con.)

Forest type and stand-size class	Forest industry						Other private					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	0	0	0	0	0	0	--	--	--	113.5	253.2	366.7
Poletimber	0	0	0	0	0	0	--	--	--	--	50.0	50.0
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	--	--
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	--	113.5	303.2	416.7
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	0	0	0	0	0	0	--	--	--	170.8	779.2	950.0
Poletimber	0	0	0	0	0	0	--	--	--	--	33.3	33.3
Sapling and seedling	0	0	0	0	0	0	--	27.7	--	27.8	27.9	83.4
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	27.7	--	198.6	840.4	1,066.7
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Whitebark-limber pine:												
Sawtimber	0	0	0	0	0	0	--	--	1.1	9.2	23.0	33.3
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	--	--
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	1.1	9.2	23.0	33.3
True firs:												
Sawtimber	0	0	0	0	0	0	--	--	--	--	--	--
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	--	--
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	--	--	--	--
Fir-spruce:												
Sawtimber	0	0	0	0	0	0	--	--	--	200.0	--	200.0
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	11.1	--	11.1	11.1	33.3
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	11.1	--	211.1	11.1	233.3
Other softwoods:												
Sawtimber	0	0	0	0	0	0	--	--	--	--	--	--
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	--	--
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	--	--	--	--
Aspen:												
Sawtimber	0	0	0	0	0	0	--	--	56.3	56.4	--	112.7
Poletimber	0	0	0	0	0	0	--	--	--	24.2	24.1	48.3
Sapling and seedling	0	0	0	0	0	0	--	5.4	--	5.4	5.3	16.1
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	5.4	56.3	86.0	29.4	177.1
Cottonwood:												
Sawtimber	0	0	0	0	0	0	--	--	--	--	--	--
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	--	--
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	--	--	--	--
Other hardwoods:												
Sawtimber	0	0	0	0	0	0	--	--	--	--	--	--
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	--	--
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	--	--	--	--
All forest type:												
Sawtimber	0	0	0	0	0	0	--	--	57.4	549.9	1,055.4	1,662.7
Poletimber	0	0	0	0	0	0	--	--	--	24.2	107.4	131.6
Sapling and seedling	0	0	0	0	0	0	--	44.2	--	44.3	44.3	132.8
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	44.2	57.4	618.4	1,207.1	1,927.1

Table 23.--Area of commercial timberland in Utah by owner group, forest type, stand-size class, and productivity class, 1977

Forest type and stand-size class	National Forest						Other public					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	--	(1)	.9	48.4	189.4	238.7	--	--	1.1	21.8	74.5	97.4
Poletimber	--	--	--	1.2	27.9	29.1	--	--	--	--	3.9	3.9
Sapling and seedling	--	--	--	(1)	3.7	3.7	--	--	--	2.6	11.4	14.0
Nonstocked	--	--	--	--	1.8	1.8	--	--	.5	.5	--	1.0
Total	--	(1)	.9	49.6	222.8	273.3	--	--	1.6	24.9	89.8	116.3
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	--	--	--	2.5	273.4	275.9	--	--	--	8.3	53.6	61.9
Poletimber	--	--	--	--	13.6	13.6	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	23.7	23.7	--	--	--	--	1.4	1.4
Nonstocked	--	--	--	--	10.9	10.9	--	--	--	5.9	2.3	8.2
Total	--	--	--	2.5	321.6	324.1	--	--	--	14.2	57.3	71.5
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	--	--	--	8.0	208.5	216.5	--	--	--	--	6.7	6.7
Poletimber	--	--	--	1.8	172.1	173.9	--	--	--	--	2.1	2.1
Sapling and seedling	--	--	--	--	33.4	33.4	--	--	--	--	.5	.5
Nonstocked	--	--	--	--	.9	.9	--	--	--	--	1.7	1.7
Total	--	--	--	9.8	414.9	424.7	--	--	--	--	11.0	11.0
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Limber pine:												
Sawtimber	--	--	--	([1])	18.6	18.6	--	--	--	--	1.4	1.4
Poletimber	--	--	--	--	.7	.7	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	6.0	6.0
Total	--	--	--	([1])	19.3	19.3	--	--	--	--	7.4	7.4
White firs:												
Sawtimber	--	--	--	18.1	91.5	109.6	--	--	.9	5.1	1.3	7.3
Poletimber	--	--	--	--	7.2	7.2	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	3.3	3.3	--	--	--	.5	--	.5
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	18.1	102.0	120.1	--	--	.9	5.6	1.3	7.8
Fir-spruce:												
Sawtimber	--	--	23.5	215.2	346.9	585.6	--	.4	13.6	23.5	8.9	46.4
Poletimber	--	--	--	8.3	50.9	59.2	--	--	1.9	4.4	1.4	7.7
Sapling and seedling	--	--	--	3.4	19.0	22.4	--	--	--	2.2	.7	2.9
Nonstocked	--	--	--	--	3.0	3.0	--	--	--	--	--	--
Total	--	--	23.5	226.9	419.8	670.2	--	.4	15.5	30.1	11.0	57.0
Pinyon-juniper:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	9.5	9.5
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	1.3	1.3
Total	--	--	--	--	--	--	--	--	--	--	10.8	10.8
Aspen:												
Sawtimber	--	--	--	16.9	135.3	152.2	--	--	2.1	23.9	6.2	32.2
Poletimber	--	--	--	16.1	201.9	218.0	--	--	2.3	11.0	17.8	31.1
Sapling and seedling	--	--	--	--	46.2	46.2	--	--	--	4.2	10.0	14.2
Nonstocked	--	--	--	2.3	26.6	28.9	--	--	--	--	.5	.5
Total	--	--	--	35.3	410.0	445.3	--	--	4.4	39.1	34.5	78.0
Cottonwood:												
Sawtimber	--	--	--	--	--	--	--	--	--	--	1.7	1.7
Poletimber	--	--	--	--	--	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	1.7	1.7
All forest types:												
Sawtimber	--	([1])	24.4	309.1	1,263.6	1,597.1	--	.4	17.7	82.6	163.8	264.5
Poletimber	--	--	--	27.4	474.3	501.7	--	--	4.2	15.4	25.2	44.8
Sapling and seedling	--	--	--	3.4	129.3	132.7	--	--	--	9.5	24.0	33.5
Nonstocked	--	--	--	2.3	43.2	45.5	--	--	.5	6.4	11.8	18.7
Total	--	([1])	24.4	342.2	1,910.4	2,277.0	--	.4	22.4	113.9	224.8	361.5

[1]Less than 0.05 thousand acres.

Table 23 (con.)

Forest type and stand-size class	Forest industry						Other private					
	Productivity class					Total	Productivity class					Total
	165+	120-164	85-119	50-84	20-49		165+	120-164	85-119	50-84	20-49	
	Thousand acres											
Douglas-fir:												
Sawtimber	0	0	0	0	0	0	--	--	4.1	31.2	55.2	90.5
Poletimber	0	0	0	0	0	0	--	--	--	--	6.4	6.4
Sapling and seedling	0	0	0	0	0	0	--	--	--	1.8	9.5	11.3
Nonstocked	0	0	0	0	0	0	--	--	2.2	2.1	--	4.3
Total	0	0	0	0	0	0	--	--	6.3	35.1	71.1	112.5
Hemlock:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine:												
Sawtimber	0	0	0	0	0	0	--	--	--	4.0	21.4	25.4
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	1.0	1.0
Nonstocked	0	0	0	0	0	0	--	--	--	1.3	3.5	4.8
Total	0	0	0	0	0	0	--	--	--	5.3	25.9	31.2
White pine:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine:												
Sawtimber	0	0	0	0	0	0	--	--	--	--	13.7	13.7
Poletimber	0	0	0	0	0	0	--	--	--	--	8.1	8.1
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	2.0	2.0
Nonstocked	0	0	0	0	0	0	--	--	--	--	.9	.9
Total	0	0	0	0	0	0	--	--	--	--	24.7	24.7
Larch:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar:												
Sawtimber	0	0	0	0	0	0	0	0	0	0	0	0
Poletimber	0	0	0	0	0	0	0	0	0	0	0	0
Sapling and seedling	0	0	0	0	0	0	0	0	0	0	0	0
Nonstocked	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Limber pine:												
Sawtimber	--	--	--	( )	18.6	18.6	--	--	--	--	1.4	1.4
Poletimber	--	--	--	--	.7	.7	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--	--	--	--	6.0	6.0
Total	--	--	--	([1])	19.3	19.3	--	--	--	--	7.4	7.4
White firs:												
Sawtimber	0	0	0	0	0	0	--	--	4.3	10.5	7.3	22.1
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	1.4	--	1.4
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	4.3	11.9	7.3	23.5
Fir-spruce:												
Sawtimber	0	0	0	0	0	0	--	2.1	18.6	51.2	23.2	95.1
Poletimber	0	0	0	0	0	0	--	--	.9	6.0	2.7	9.6
Sapling and seedling	0	0	0	0	0	0	--	--	--	4.7	.5	5.2
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	2.1	19.5	61.9	26.4	109.9
Pinyon-juniper:												
Sawtimber	0	0	0	0	0	0	--	--	--	--	5.3	5.3
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	--	--
Nonstocked	0	0	0	0	0	0	--	--	--	--	1.0	1.0
Total	0	0	0	0	0	0	--	--	--	--	6.3	6.3
Aspen:												
Sawtimber	0	0	0	0	0	0	--	--	4.9	31.0	15.3	51.2
Poletimber	0	0	0	0	0	0	--	--	5.9	36.6	61.0	103.5
Sapling and seedling	0	0	0	0	0	0	--	--	--	13.8	24.5	38.3
Nonstocked	0	0	0	0	0	0	--	--	--	--	.7	.7
Total	0	0	0	0	0	0	--	--	10.8	81.4	101.5	193.7
Cottonwood:												
Sawtimber	0	0	0	0	0	0	--	--	--	--	8.8	8.8
Poletimber	0	0	0	0	0	0	--	--	--	--	--	--
Sapling and seedling	0	0	0	0	0	0	--	--	--	--	--	--
Nonstocked	0	0	0	0	0	0	--	--	--	--	--	--
Total	0	0	0	0	0	0	--	--	--	--	8.8	8.8
All forest type:												
Sawtimber	0	0	0	0	0	0	--	2.1	31.9	127.9	151.2	313.1
Poletimber	0	0	0	0	0	0	--	--	6.8	42.6	78.2	127.6
Sapling and seedling	0	0	0	0	0	0	--	--	--	21.7	37.5	59.2
Nonstocked	0	0	0	0	0	0	--	--	2.2	3.4	7.3	12.9
Total	0	0	0	0	0	0	--	2.1	40.9	195.6	274.2	512.8

Table 24.--Area of productive reserved, productive deferred, and other forest land in the Rocky Mountain States by forest type and State, 1977

State	Forest type														
	Douglas-fir	Ponderosa pine	Western white pine	Hemlock	Larch	Lodgepole pine	Spruce	True firs	Pinyon-juniper	Other softwoods	Aspen	Cottonwood	Other hardwoods	Chaparral	Total
	Thousand acres														
Northern Rocky Mountain States:															
North Idaho:															
Productive reserved	212.5	76.6	6.4	26.2	41.8	298.3	22.1	147.6	--	22.4	--	--	2.3	--	856.2
Productive deferred	180.0	56.9	1.7	9.3	19.8	127.1	8.7	82.7	--	11.3	--	--	.7	--	498.2
Other forest land:															
Reserved	44.4	19.1	.3	.9	3.4	151.6	25.0	86.7	--	37.6	--	--	--	--	369.0
Nonreserved	138.5	32.4	11.4	27.8	42.5	211.5	19.3	203.2	--	60.7	1.1	--	.4	81.4	830.2
Total	575.4	185.0	19.8	64.2	107.5	788.5	75.1	520.2	--	132.0	1.1	--	3.4	81.4	2,553.6
South Idaho:															
Productive reserved	481.6	67.3	0	0	—	240.9	81.2	122.3	--	46.8	10.0	(1)	6.7	--	1,056.8
Productive deferred	187.7	59.3	0	0	1.0	74.4	21.4	68.1	--	16.7	5.7	.3	2.5	--	437.1
Other forest land:															
Reserved	79.5	4.2	0	0	--	10.6	7.9	68.6	--	56.8	7.8	(1)	5.6	1.2	242.2
Nonreserved	1,313.4	286.0	0	0	.7	524.2	65.8	512.6	404.3	351.2	280.7	2.4	57.6	97.4	3,896.3
Total	2,062.2	416.8	0	0	1.7	850.1	176.3	771.6	404.3	471.5	304.2	2.7	72.4	98.6	5,632.4
Western Montana:															
Productive reserved	141.6	48.8	2.6	15.6	151.8	441.9	173.0	74.2	--	112.0	2.0	--	—	--	1,163.5
Productive deferred	95.2	16.7	1.8	3.0	31.2	122.7	18.8	63.4	--	14.3	--	--	--	--	367.1
Other forest land:															
Reserved	30.4	.2	.2	16.3	8.5	52.0	57.0	73.9	—	385.7	--	(1)	--	--	624.2
Nonreserved	166.2	18.7	1.9	11.7	35.6	173.0	85.9	155.2	7.1	327.3	26.0	--	--	2.1	1,010.7
Total	433.4	84.4	6.5	46.6	227.1	789.6	334.7	366.7	7.1	839.3	28.0	(1)	—	2.1	3,165.5
Eastern Montana:															
Productive reserved	118.8	3.9	0	0	0	486.0	36.4	50.1	--	132.1	11.0	--	--	--	838.3
Productive deferred	72.5	.6	0	0	0	196.2	5.8	33.2	--	29.0	4.3	--	--	--	341.6
Other forest land:															
Reserved	99.2	7.4	0	0	0	196.8	5.1	53.3	--	383.9	2.9	--	--	1.8	750.4
Nonreserved	394.0	216.4	0	0	0	613.3	117.7	85.4	469.1	571.2	162.3	39.6	93.6	341.5	3,104.1
Total	684.5	228.3	0	0	0	1,492.3	165.0	222.0	469.1	1,116.2	180.5	39.6	93.6	343.3	5,034.4
Western South Dakota:															
Productive reserved	0	11.1	0	0	0	--	--	0	--	--	--	--	--	--	11.1
Productive deferred	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other forest land:															
Reserved	0	.8	0	0	0	--	.2	0	--	--	--	--	.3	--	1.3
Nonreserved	0	66.6	0	0	0	--	.5	0	4.4	3.8	2.3	4.4	28.8	--	110.8
Total	0	78.5	0	0	0	0	.7	0	4.4	3.8	2.3	4.4	29.1	-	123.2
Wyoming:															
Productive reserved	237.4	.2	0	0	0	1,657.2	475.6	142.4	--	163.3	12.5	--	--	--	2,688.6
Productive deferred	65.9	1.2	0	0	0	109.6	60.5	45.3	--	44.4	4.2	.2	--	--	331.3
Other forest land:															
Reserved	37.7	--	0	0	0	41.0	69.1	32.9	.1	88.2	10.7	--	--	12.3	292.0
Nonreserved	307.4	80.5	0	0	0	395.4	346.3	150.0	577.6	173.2	229.3	.5	.3	121.7	2,382.2
Total	648.4	81.9	0	0	0	2,203.2	951.5	370.6	577.7	469.1	256.7	.7	.3	134.0	5,694.1
Total, Northern Rocky Mountain States:															
Productive reserved	1,191.9	207.9	9.0	41.8	193.6	3,124.3	788.3	536.6	--	476.6	35.5	(1)	9.0	--	6,614.5
Productive deferred	601.3	134.7	3.5	12.3	52.0	630.0	115.2	292.7	--	115.7	14.3	.5	3.2	--	1,975.3
Other forest land:															
Reserved	291.2	31.7	.5	17.2	11.9	452.0	164.3	315.4	.1	952.2	21.4	(1)	5.9	15.3	2,279.1
Nonreserved	2,319.5	700.6	13.3	39.5	78.8	1,917.4	635.5	1,106.4	1,462.5	1,487.4	701.7	46.9	180.7	644.1	11,334.3
Total	4,403.9	1,074.9	26.3	110.8	336.3	6,123.7	1,703.3	2,251.1	1,462.6	3,031.9	772.8	47.4	198.8	659.4	22,203.2

[1]Less than 0.05 thousand acres.

Table 24 (con.)

State	Forest type														
	Douglas-fir	Ponderosa pine	Western white pine	Hemlock	Larch	Lodgepole pine	Spruce	True firs	Pinyon-juniper	Other softwoods	Aspen	Cottonwood	Other hardwoods	Chaparral	Total
	Thousand acres														
Southern Rocky Mountain States:															
Arizona:															
Productive reserved	37.9	332.8	0	0	0	0	8.4	--	--	--	3.7	--	--	--	382.8
Productive deferred	4.1	13.5	0	0	0	0	.4	--	--	--	1.1	--	--	--	19.1
Other forest land:															
Reserved	--	--	0	0	0	0	--	--	760.8	--	--	--	--	--	760.8
Nonreserved	.7	421.3	0	0	0	0	--	.7	11,265.5	--	8.5	--	109.9	1,629.0	13,435.6
Total	42.7	767.6	0	0	0	0	8.8	.7	12,026.3	--	13.3	--	109.9	1,629.0	14,598.3
Colorado:															
Productive reserved	17.6	22.2	0	0	0	109.0	506.4	(1)	--	.2	28.6	(1)	--	--	684.0
Productive deferred	31.2	24.3	0	0	0	169.1	445.3	1.3	--	.1	80.9	--	--	--	752.2
Other forest land:															
Reserved	4.9	.7	0	0	0	2.5	89.6	--	148.5	39.5	7.3	--	--	28.0	321.0
Nonreserved	134.5	209.6	0	0	0	245.5	522.7	.2	4,258.5	344.1	511.6	1.7	--	2,970.7	9,199.1
Total	188.2	256.8	0	0	0	526.1	1,564.0	1.5	4,407.0	383.9	628.4	1.7	--	2,998.7	10,956.3
Nevada:															
Productive reserved	.8	.8	--	--	0	--	.2	3.4	--	--	.7	--	--	--	5.9
Productive deferred	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other forest land:															
Reserved	.3	--	--	--	0	--	--	18.3	14.5	18.6	8.0	--	1.9	5.0	66.6
Nonreserved	16.0	13.5	--	--	0	46.1	3.3	86.4	4,644.7	1,249.8	212.3	6.9	13.7	1,183.8	7,476.5
Total	17.1	14.3	0	0	0	46.1	3.5	108.1	4,659.2	1,268.4	221.0	6.9	15.6	1,188.8	7,549.0
New Mexico:															
Productive reserved	152.2	252.4	0	0	0	0	111.7	--	--	.1	34.1	--	--	--	550.5
Productive deferred	98.0	123.1	0	0	0	0	36.0	--	--	--	22.4	--	--	--	279.5
Other forest land:															
Reserved	--	43.8	0	0	0	0	--	--	442.3	--	13.8	--	.1	3.5	503.5
Nonreserved	55.4	417.7	0	0	0	0	8.2	10.6	10,236.4	4.6	27.4	--	4.4	424.1	11,188.8
Total	305.6	837.0	0	0	0	0	155.9	10.6	10,678.7	4.7	97.7	--	4.5	427.6	12,522.3
Utah:															
Productive reserved	18.1	15.9	0	0	0	33.4	31.3	14.0	(1)	.1	11.5	--	--	--	124.3
Productive deferred	20.2	15.4	0	0	0	41.9	36.8	26.9	--	.1	16.0	--	--	--	157.3
Other forest land:															
Reserved	6.0	1.9	0	0	0	19.3	5.8	3.3	354.0	1.4	3.5	1.5	32.0	--	428.7
Nonreserved	195.6	95.9	0	0	0	148.1	186.8	204.9	8,846.0	24.0	900.0	67.5	1,536.2	--	12,205.0
Total	239.9	129.1	0	0	0	242.7	260.7	249.1	9,200.0	25.6	931.0	69.0	1,568.2	--	12,915.3
Total, Southern Rocky Mountain States:															
Productive reserved	226.6	624.1	--	--	0	142.4	658.0	17.4	(1)	.4	78.6	(1)	--	--	1,747.5
Productive deferred	153.5	176.3	--	--	0	211.0	518.5	28.2	--	.2	120.4	--	--	--	1,208.1
Other forest land:															
Reserved	11.2	46.4	--	--	0	21.8	95.4	21.6	1,720.1	59.5	32.6	1.5	34.0	36.5	2,080.6
Nonreserved	402.2	1,158.0	--	--	0	439.7	721.0	302.8	39,251.1	1,622.5	1,659.8	76.1	1,664.2	6,207.6	53,505.0
Total	793.5	2,004.8	--	--	0	814.9	1,992.9	370.0	40,971.2	1,682.6	1,891.4	77.6	1,698.2	6,244.1	58,541.2
Total, Rocky Mountain States															
Productive reserved	1,418.5	832.0	9.0	41.8	193.6	3,266.7	1,446.3	554.0	(1)	477.0	114.1	(1)	9.0	--	8,362.0
Productive deferred	754.8	311.0	3.5	12.3	52.0	841.0	633.7	320.9	--	115.9	134.6	.5	3.2	--	3,183.4
Other forest land:															
Reserved	302.4	78.1	.5	17.2	11.9	473.8	259.7	337.0	1,720.2	1,011.7	54.0	1.5	39.9	51.8	4,359.7
Nonreserved	2,721.7	1,858.6	13.3	39.5	78.8	2,357.1	1,356.5	1,409.2	40,713.6	3,109.9	2,361.5	123.0	1,844.9	6,851.7	64,839.3
Total	5,197.4	3,079.7	26.3	110.8	336.3	6,938.6	3,696.2	2,621.1	42,433.8	4,714.5	2,664.2	125.0	1,897.0	6,903.5	80,744.4

[1]Less than 0.05 thousand acres.

Table 25.--Number of growing stock trees on commercial timberland in the Northern Rocky Mountain States by diameter class and species group, 1977

State; diameter class (inches)	Softwoods	Hardwoods	All species
		Thousand trees	
North Idaho			
1.0-2.9	883,472	27,132	910,604
3.0-4.9	634,369	15,623	649,992
5.0-6.9	467,542	8,637	476,179
7.0-8.9	315,386	4,074	319,460
9.0-10.9	204,481	1,591	206,072
11.0-12.9	126,163	589	126,752
13.0-14.9	81,340	243	81,583
15.0-16.9	50,036	90	50,126
17.0-18.9	32,591	49	32,640
19.0-20.9	20,769	26	20,795
21.0-22.9	13,849	24	13,873
23.0-24.9	9,104	23	9,127
25.0-26.9	5,888	22	5,910
27.0-28.9	3,883	20	3,903
29.0+	7,322	57	7,379
Total	2,856,195	58,200	2,914,395

Table 26.--Number of growing stock trees on commercial timberland in the Northern Rocky Mountain States by diameter class and species group, 1977

State; diameter class (inches)	Softwoods	Hardwoods	All species
		Thousand trees	
South Idaho			
1.0-2.9	496,318	14,406	510,724
3.0-4.9	433,735	11,158	444,893
5.0-6.9	272,098	6,080	278,178
7.0-8.9	178,872	4,172	183,044
9.0-10.9	107,759	2,324	110,083
11.0-12.9	62,032	1,332	63,364
13.0-14.9	42,627	685	43,312
15.0-16.9	24,724	315	25,039
17.0-18.9	16,160	184	16,344
19.0-20.9	11,054	108	11,162
21.0-22.9	8,077	67	8,144
23.0-24.9	6,008	41	6,049
25.0-26.9	4,125	26	4,151
27.0-28.9	2,919	16	2,935
29.0+	7,976	10	7,986
Total	1,674,484	40,924	1,715,408

Table 27.--Number of growing stock trees on commercial timberland in the Northern Rocky Mountain States by diameter class and species group, 1977

State; diameter class (inches)	Softwoods	Hardwoods	All species
	- - - - - - - - - - *Thousand trees* - - - - - - - - - -		
Western Montana			
1.0-2.9	2,353,158	32,212	2,385,370
3.0-4.9	1,455,860	9,853	1,465,713
5.0-6.9	939,651	5,785	945,436
7.0-8.9	554,020	2,166	556,186
9.0-10.9	295,721	735	296,456
11.0-12.9	163,568	569	164,137
13.0-14.9	92,798	298	93,096
15.0-16.9	54,250	227	54,477
17.0-18.9	32,534	131	32,665
19.0-20.9	20,695	13	20,708
21.0-22.9	12,534	101	12,635
23.0-24.9	6,615	22	6,637
25.0-26.9	4,228	1	4,229
27.0-28.9	2,438	--	2,438
29.0+	3,780	2	3,782
Total	5,991,850	52,115	6,043,965

Table 28.--Number of growing stock trees on commercial timberland in the Northern Rocky Mountain States by diameter class and species group, 1977

State; diameter class (inches)	Softwoods	Hardwoods	All species
	- - - - - - - - - - *Thousand trees* - - - - - - - - - -		
Eastern Montana			
1.0-2.9	1,070,197	783	1,070,980
3.0-4.9	642,841	2,634	645,475
5.0-6.9	451,620	3,260	454,880
7.0-8.9	264,243	3,309	267,552
9.0-10.9	142,858	2,834	145,692
11.0-12.9	74,634	2,359	76,993
13.0-14.9	37,798	1,882	39,680
15.0-16.9	19,606	1,414	21,020
17.0-18.9	9,778	1,033	10,811
19.0-20.9	5,242	743	5,985
21.0-22.9	2,743	521	3,264
23.0-24.9	1,464	362	1,826
25.0-26.9	797	242	1,039
27.0-28.9	378	160	538
29.0+	609	18	627
Total	2,724,808	21,554	2,746,362

Table 29.--Number of growing stock trees on commercial timberland in the Northern Rocky Mountain States by diameter class and species group, 1977

State; diameter class (inches)	Softwoods	Hardwoods	All species
	Thousand trees		
Western South Dakota			
1.0-2.9	189,327	7,517	196,844
3.0-4.9	113,123	3,831	116,954
5.0-6.9	78,110	3,663	81,773
7.0-8.9	49,878	949	50,827
9.0-10.9	30,769	276	31,045
11.0-12.9	17,974	61	18,035
13.0-14.9	9,854	18	9,872
15.0-16.9	5,065	8	5,073
17.0-18.9	2,535	11	2,546
19.0-20.9	1,192	4	1,196
21.0-22.9	467	7	474
23.0-24.9	179	2	181
25.0-26.9	78	5	83
27.0-28.9	15	--	15
29.0+	10	5	15
Total	498,576	16,357	514,933

Table 30.--Number of growing stock trees on commercial timberland in the Northern Rocky Mountain States by diameter class and species group, 1977

State; diameter class (inches)	Softwoods	Hardwoods	All species
	Thousand trees		
Wyoming			
1.0-2.9	682,885	55,352	738,237
3.0-4.9	449,911	38,659	488,570
5.0-6.9	302,939	25,096	328,035
7.0-8.9	182,528	12,865	195,393
9.0-10.9	117,580	6,509	124,089
11.0-12.9	65,009	2,554	67,563
13.0-14.9	37,246	1,010	38,256
15.0-16.9	19,397	293	19,690
17.0-18.9	11,116	57	11,173
19.0-20.9	6,176	4	6,180
21.0-22.9	3,196	4	3,200
23.0-24.9	1,900	--	1,900
25.0-26.9	1,262	1	1,263
27.0-28.9	588	--	588
29.0+	896	1	897
Total	1,882,629	142,405	2,025,034

Table 31.--Number of growing stock trees on commercial timberland in the Southern Rocky Mountain States by diameter class and species group, 1977

State; diameter class (inches)	Softwoods	Hardwoods	All species
	Thousand trees		
Arizona			
1.0-2.9	350,666	14,656	365,322
3.0-4.9	202,135	9,733	211,868
5.0-6.9	117,073	10,796	127,869
7.0-8.9	77,580	6,384	83,964
9.0-10.9	53,116	4,043	57,159
11.0-12.9	35,162	2,838	38,000
13.0-14.9	23,142	1,680	24,822
15.0-16.9	16,160	822	16,982
17.0-18.9	11,975	483	12,458
19.0-20.9	8,770	201	8,971
21.0-22.9	6,270	111	6,381
23.0-24.9	4,761	15	4,776
25.0-26.9	3,199	8	3,207
27.0-28.9	2,209	3	2,212
29.0+	2,713	1	2,714
Total	914,931	51,774	966,705

Table 32.--Number of growing stock trees on commercial timberland in the Southern Rocky Mountain States by diameter class and species group, 1977

State; diameter class (inches)	Softwoods	Hardwoods	All species
	Thousand trees		
Colorado			
1.0-2.9	806,251	597,798	1,404,049
3.0-4.9	590,109	358,884	948,993
5.0-6.9	416,099	213,425	629,524
7.0-8.9	286,557	111,618	398,175
9.0-10.9	182,535	55,927	238,462
11.0-12.9	107,932	22,421	130,353
13.0-14.9	61,959	8,935	70,894
15.0-16.9	36,295	3,721	40,016
17.0-18.9	20,864	1,594	22,458
19.0-20.9	11,870	664	12,534
21.0-22.9	7,206	205	7,411
23.0-24.9	4,260	143	4,403
25.0-26.9	2,267	46	2,313
27.0-28.9	1,397	39	1,436
29.0+	1,464	--	1,464
Total	2,537,065	1,375,420	3,912,485

Table 33.--Number of growing stock trees on commercial timberland in the Southern Rocky Mountain States by diameter class and species group, 1977

State; diameter class (inches)	Softwoods	Hardwoods	All species
		Thousand trees	
Nevada			
1.0-2.9	4,105	532	4,637
3.0-4.9	3,235	510	3,745
5.0-6.9	2,672	1,204	3,876
7.0-8.9	1,763	401	2,164
9.0-10.9	1,374	294	1,668
11.0-12.9	1,046	363	1,409
13.0-14.9	744	116	860
15.0-16.9	658	3	661
17.0-18.9	485	2	487
19.0-20.9	377	1	378
21.0-22.9	297	--	297
23.0-24.9	249	--	249
25.0-26.9	184	--	184
27.0-28.9	146	--	146
29.0+	337	--	337
Total	17,672	3,426	21,098

Table 34.--Number of growing stock trees on commercial timberland in the Southern Rocky Mountain States by diameter class and species group, 1977

State; diameter class (inches)	Softwoods	Hardwoods	All species
		Thousand trees	
New Mexico			
1.0-2.9	538,093	56,104	594,197
3.0-4.9	326,947	45,108	372,055
5.0-6.9	197,249	34,162	231,411
7.0-8.9	118,424	20,606	139,030
9.0-10.9	75,027	11,117	86,144
11.0-12.9	47,579	6,215	53,794
13.0-14.9	31,137	2,975	34,112
15.0-16.9	20,346	1,608	21,954
17.0-18.9	13,423	810	14,233
19.0-20.9	8,344	356	8,700
21.0-22.9	5,284	157	5,441
23.0-24.9	3,405	2	3,407
25.0-26.9	2,078	--	2,078
27.0-28.9	1,235	--	1,235
29.0+	1,302	--	1,302
Total	1,389,873	179,220	1,569,093

Table 35.--Number of growing stock trees on commercial timberland in the Southern Rocky Mountain States by diameter class and species group, 1977

State; diameter class (inches)	Softwoods	Hardwoods	All species
	- - - - - - - - - - *Thousand trees* - - - - - - - - - -		
Utah			
1.0-2.9	255,400	97,592	352,992
3.0-4.9	193,285	96,154	289,439
5.0-6.9	139,060	76,993	216,053
7.0-8.9	85,224	34,747	119,971
9.0-10.9	51,865	14,732	66,597
11.0-12.9	29,880	8,347	38,227
13.0-14.9	19,040	3,644	22,684
15.0-16.9	10,702	1,564	12,266
17.0-18.9	7,209	640	7,849
19.0-20.9	4,132	155	4,287
21.0-22.9	2,566	106	2,672
23.0-24.9	1,794	45	1,839
25.0-26.9	1,053	18	1,071
27.0-28.9	647	12	659
29.0+	1,083	6	1,089
Total	802,940	334,755	1,137,695

Table 36.--Growing stock trees per acre on commercial timberland in the Rocky Mountain States by owner group and diameter class, 1977

State and owner group	Diameter class (inches at breast height)															
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Trees per acre															
Northern Rocky Mountain States:																
North Idaho:																
National Forest	70.2	47.1	49.7	36.2	24.1	14.8	10.0	6.1	4.2	2.7	1.9	1.3	0.9	0.6	1.2	271.0
Other public and private	175.5	128.9	76.1	47.6	29.9	18.3	11.3	7.0	4.3	2.7	1.6	1.0	.6	.4	.7	505.9
South Idaho:																
National Forest	84.9	77.6	48.4	31.8	18.8	10.6	7.3	4.1	2.7	1.9	1.4	1.1	.7	.5	1.5	293.3
Other public and private	103.6	69.6	44.4	29.5	19.3	12.5	8.1	5.2	3.4	2.1	1.4	.9	.5	.3	.7	301.5
Western Montana:																
National Forest	191.5	122.7	89.3	53.6	26.5	14.0	7.6	4.3	2.6	1.8	1.1	.7	.5	.3	.5	517.0
Other public and private	347.6	206.0	117.7	67.6	39.2	22.6	13.3	8.0	4.7	2.9	1.7	1.0	.4	.3	.2	832.9
Eastern Montana:																
National Forest	241.2	149.4	120.0	72.0	38.5	19.6	9.5	4.8	2.2	1.2	.6	.3	.2	.1	.2	659.8
Other public and private	189.6	110.1	62.5	35.2	19.9	11.3	6.4	3.7	2.1	1.2	.7	.4	.2	.1	.1	445.5
Western South Dakota:																
National Forest	143.1	82.7	65.2	42.7	25.8	14.9	8.2	4.4	2.2	1.1	.4	.2	.1	([1])	([1])	391.0
Other public and private	207.4	131.0	67.5	34.9	22.1	13.0	7.1	3.0	1.6	.7	.3	.1	([1])	([1])	([1])	488.7
Wyoming:																
National Forest	112.4	91.5	71.5	44.7	30.6	16.9	9.8	5.0	2.9	1.6	.8	.5	.4	.2	.3	389.1
Other public and private	307.0	162.8	85.7	46.1	25.9	12.5	6.6	3.5	1.8	.9	.5	.3	.1	([1])	.1	651.8
Total, Northern Rocky Mountain States:																
National Forest	135.2	94.2	72.0	45.5	26.2	14.5	8.6	4.8	2.9	1.9	1.2	.8	.6	.3	.8	409.5
Other public and private	240.9	148.3	84.7	49.5	29.1	17.1	10.1	6.0	3.6	2.2	1.3	.7	.4	.2	.4	594.5
Southern Rocky Mountain States:																
Arizona:																
National Forest	105.3	56.9	32.2	20.2	13.6	8.8	5.6	3.8	3.0	2.2	1.6	1.3	0.8	0.6	0.7	256.6
Other public and private	74.0	50.0	33.8	23.9	16.5	11.3	7.8	5.3	3.6	2.5	1.7	1.2	.8	.5	.7	233.6
Colorado:																
National Forest	88.3	71.9	53.5	35.9	22.5	12.3	6.7	3.9	2.2	1.3	.8	.5	.3	.2	.2	300.5
Other public and private	194.5	107.4	59.7	33.8	18.3	9.9	5.3	2.9	1.5	.8	.4	.2	.1	.1	.1	435.0
Nevada																
National Forest	39.4	33.0	40.8	18.0	13.7	12.5	5.8	4.4	2.9	2.2	1.8	1.6	1.1	.9	1.7	179.8
Other public and private	30.5	23.6	18.9	14.5	11.3	8.8	6.9	5.4	4.2	3.3	2.6	2.0	1.6	1.7	3.2	138.1
New Mexico:																
National Forest	80.7	48.6	33.0	20.2	13.4	8.7	5.9	4.1	2.8	1.8	1.1	.7	.4	.3	.3	222.0
Other public and private	134.8	86.5	50.9	30.2	17.8	10.8	6.5	3.8	2.3	1.4	.8	.5	.3	.2	.1	346.9
Utah:																
National Forest	115.1	96.8	72.8	39.9	21.4	12.1	7.2	3.9	2.5	1.4	.8	.6	.4	.2	.4	375.5
Other public and private	103.8	78.8	57.5	33.4	20.5	12.1	7.2	3.9	2.5	1.5	1.0	.6	.3	.2	.3	323.4
Total, Southern Rocky Mountain States:																
National Forest	93.5	68.7	49.1	30.9	19.1	11.1	6.5	3.9	2.5	1.5	1.0	.7	.4	.2	.4	289.5
Other public and private	146.7	88.3	52.3	30.9	18.0	10.6	6.3	3.7	2.2	1.3	.8	.5	.3	.2	.2	362.3
Total, Rocky Mountain States:																
National Forest	117.9	83.6	62.5	39.4	23.3	13.1	7.7	4.4	2.8	1.7	1.1	.8	.5	.3	.6	359.7
Other public and private	201.1	122.9	71.0	41.7	24.4	14.3	8.5	5.0	3.0	1.8	1.1	.6	.4	.2	.3	496.3

[1]Less than 0.05 trees per acre.

Table 37.--Net volume of growing stock on commercial timberland in the Northern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million cubic feet													
North Idaho														
Douglas-fir	267.1	353.7	477.5	519.4	526.0	484.1	396.7	335.0	287.6	207.2	160.8	107.5	211.0	4,333.6
Ponderosa pine	26.8	38.9	81.8	113.9	134.5	115.4	101.4	84.8	66.0	58.8	57.4	60.5	244.9	1,185.1
Western white pine	48.0	111.9	128.7	190.2	161.8	184.1	196.1	183.3	166.0	148.9	100.6	78.3	214.8	1,912.7
Lodgepole pine	380.1	539.6	464.1	307.5	166.1	97.5	47.6	10.0	6.5	.4	1.0	.4	.3	2,021.1
Whitebark pine	1.3	1.7	3.5	5.6	10.3	15.7	4.9	7.4	2.9	1.3	.9	.2	1.6	57.3
Western larch	121.4	177.3	191.5	173.3	172.4	131.3	119.9	90.1	102.8	69.9	47.5	30.8	118.0	1,546.2
Grand fir	215.5	330.4	398.0	443.3	449.6	386.3	374.2	310.5	249.2	242.3	216.8	168.7	450.6	4,235.4
Subalpine fir[1]	71.2	136.0	182.7	134.5	128.9	131.7	103.0	60.9	56.1	23.0	18.5	3.8	8.3	1,058.6
White fir	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engelmann spruce	35.0	66.5	87.9	119.0	139.5	130.3	129.8	127.8	110.6	92.8	55.0	40.5	86.2	1,220.9
Western hemlock[2]	49.3	95.9	128.6	124.0	140.5	121.0	113.5	87.3	65.8	59.3	38.7	27.6	87.3	1,138.8
Western redcedar	87.4	129.1	174.3	183.8	194.2	162.5	163.8	164.9	125.5	101.0	88.5	90.4	341.1	2,006.5
Other softwoods	52.0	160.0	--	--	--	--	--	--	--	--	--	--	--	212.0
Total softwoods	1,355.1	2,141.0	2,318.6	2,314.5	2,223.8	1,959.9	1,750.9	1,462.0	1,239.0	1,004.9	785.7	608.7	1,764.1	20,928.2
Aspen	2.6	4.2	.2	.5	.5	--	--	--	--	--	--	--	--	8.0
Cottonwood	--	--	--	1.9	1.8	1.6	1.0	.8	.9	1.1	.5	1.3	6.7	17.6
Other hardwoods	31.0	18.4	12.9	3.7	1.5	.1	.7	--	--	--	.7	--	4.2	73.2
Total hardwoods	33.6	22.6	13.1	6.1	3.8	1.7	1.7	.8	.9	1.1	1.2	1.3	10.9	98.8
All species	1,388.7	2,163.6	2,331.7	2,320.6	2,227.6	1,961.6	1,752.6	1,462.8	1,239.9	1,006.0	786.9	610.0	1,775.0	21,027.0

[1] Includes corkbark fir.
[2] Includes mountain hemlock.

Table 38.--Net volume of sawtimber on commercial timberland in the Northern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, International 1/4-inch rule											
North Idaho												
Douglas-fir	2,028.2	2,503.4	2,587.4	2,402.0	1,972.8	1,729.2	1,512.1	1,110.6	891.9	620.7	1,195.2	18,553.5
Ponderosa pine	276.5	505.9	681.0	610.4	556.9	472.0	333.3	317.8	316.0	334.9	1,400.7	5,805.4
Western white pine	635.8	997.2	836.7	926.3	977.2	931.4	870.6	777.1	534.0	421.5	1,221.0	9,128.8
Lodgepole pine	1,993.6	1,661.7	865.3	491.7	235.0	48.2	31.6	1.9	5.1	2.1	1.7	5,337.9
Whitebark pine	18.3	32.0	56.9	83.5	25.0	35.1	14.2	6.4	4.4	1.2	7.8	284.8
Western larch	1,052.8	1,005.8	956.5	711.7	630.9	458.6	555.7	379.9	250.9	153.7	594.7	6,751.2
Grand fir	1,723.9	2,241.7	2,334.0	2,047.7	2,017.8	1,686.6	1,400.1	1,398.7	1,275.5	1,035.5	2,874.6	20,036.1
Subalpine fir[1]	777.9	682.4	645.1	660.6	514.1	299.0	292.3	122.1	101.8	20.6	46.0	4,161.9
White fir	0	0	0	0	0	0	0	0	0	0	0	0
Engelmann spruce	381.5	637.0	733.9	677.4	670.5	666.1	599.4	538.1	333.0	249.3	506.4	5,992.6
Western hemlock[2]	476.0	570.8	691.6	636.5	622.0	493.1	399.8	391.1	257.9	206.8	688.5	5,434.1
Western redcedar	757.7	831.8	887.6	752.6	764.6	763.5	610.0	507.5	463.3	485.0	1,998.0	8,821.6
Other softwoods	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	10,122.2	11,669.7	11,276.0	10,000.4	8,986.8	7,582.8	6,619.1	5,551.2	4,433.8	3,531.3	10,534.6	90,307.9
Aspen	XXXXX	2.3	2.3	--	--	--	--	--	--	--	--	4.6
Cottonwood	XXXXX	12.3	11.3	11.0	7.0	5.0	6.0	7.0	3.4	9.0	51.0	123.0
Other hardwoods	XXXXX	24.7	9.7	.3	2.9	--	--	--	5.6	--	19.0	62.2
Total hardwoods	XXXXX	39.3	23.3	11.3	9.9	5.0	6.0	7.0	9.0	9.0	70.0	189.8
All species	10,122.2	11,709.0	11,299.3	10,011.7	8,996.7	7,587.8	6,625.1	5,558.2	4,442.8	3,540.3	10,604.6	90,497.7

[1]Includes corkbark fir.
[2]Includes mountain hemlock.

Table 39.--Net volume of growing stock on commercial timberland in the Northern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
South Idaho	*Million cubic feet*													
Douglas-fir	107.0	227.6	284.5	337.1	490.2	393.1	374.2	354.0	317.9	286.5	236.4	198.9	616.1	4,223.5
Ponderosa pine	15.5	36.0	60.1	76.1	97.7	92.7	90.9	84.9	122.2	128.8	140.8	132.3	818.2	1,896.2
Western white pine	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine	324.7	506.4	489.2	331.0	168.2	80.6	38.6	19.6	10.4	6.0	1.8	1.6	.6	1,978.7
Whitebark and limber pines	8.4	18.8	18.6	14.9	13.1	10.4	4.9	2.9	3.7	1.2	.9	1.0	2.1	100.9
Western larch	.3	1.8	2.0	4.9	4.8	10.1	4.1	7.9	5.5	3.7	3.4	3.9	9.7	62.1
Grand fir	14.4	25.7	35.8	34.7	35.9	46.9	41.5	31.6	25.9	20.9	20.1	15.5	76.4	425.3
Subalpine fir[1]	120.2	153.0	165.3	150.3	130.5	99.0	76.2	61.3	35.9	28.5	13.4	8.7	10.5	1,052.8
White fir	1.6	2.8	3.0	5.8	6.8	6.9	8.2	6.5	5.4	6.0	5.6	4.0	32.5	95.1
Engelmann spruce	21.4	39.5	56.1	65.1	77.0	91.8	88.0	85.9	82.7	72.0	55.8	39.3	124.2	898.8
Western hemlock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	613.5	1,011.6	1,114.6	1,019.9	1,024.2	831.5	726.6	654.6	609.6	553.6	478.2	405.2	1,690.3	10,733.4
Aspen	13.4	16.4	15.1	15.6	7.4	1.2	.6	--	--	--	--	--	--	69.7
Cottonwood	.2	.7	4.7	4.3	8.3	8.9	7.3	5.8	4.5	3.2	2.5	1.8	1.4	53.6
Other hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	13.6	17.1	19.8	19.9	15.7	10.1	7.9	5.8	4.5	3.2	2.5	1.8	1.4	123.3
All species	627.1	1,028.7	1,134.4	1,039.8	1,039.9	841.6	734.5	660.4	614.1	556.8	480.7	407.0	1,691.7	10,856.7

[1]Includes corkbark fir.

Table 40.--Net volume of sawtimber on commercial timberland in the Northern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
South Idaho	*Million board feet, International 1/4-inch rule*											
Douglas-fir	1,227.4	1,701.0	2,548.1	2,086.0	2,042.9	1,942.5	1,836.6	1,640.2	1,368.7	1,153.2	3,563.3	21,109.9
Ponderosa pine	197.1	343.7	498.1	501.6	508.0	508.3	739.2	765.2	828.9	788.7	4,995.8	10,674.6
Western white pine	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine	2,182.9	1,740.4	888.4	426.1	205.9	104.1	53.5	32.1	10.2	9.1	3.2	5,655.9
Whitebark and limber pines	76.4	72.6	66.1	52.3	25.0	15.2	19.6	6.1	4.8	5.4	11.2	354.7
Western larch	11.0	27.6	27.0	58.8	23.6	47.5	33.3	23.5	20.8	24.0	58.5	355.6
Grand fir	142.5	148.2	158.5	223.0	206.7	153.7	125.8	98.0	95.3	78.5	363.0	1,793.2
Subalpine fir[1]	722.1	739.4	658.9	483.0	399.1	321.9	195.5	158.4	74.6	47.4	57.3	3,857.6
White fir	13.6	29.9	35.5	35.6	42.4	33.5	29.5	32.9	31.0	22.0	179.4	485.3
Engelmann spruce	264.7	333.8	396.2	478.6	461.3	448.7	454.4	401.3	314.1	219.5	682.4	4,455.0
Western hemlock	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	4,837.7	5,136.6	5,276.8	4,345.0	3,914.9	3,575.4	3,487.4	3,157.7	2,748.4	2,347.8	9,914.1	48,741.8
Aspen	XXXXX	74.1	34.8	5.4	2.4	--	--	--	--	--	--	116.7
Cottonwood	XXXXX	23.2	44.6	47.8	39.4	31.8	24.4	18.0	14.4	10.0	8.0	261.6
Other hardwoods	XXXXX	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	XXXXX	97.3	79.4	53.2	41.8	31.8	24.4	18.0	14.4	10.0	8.0	378.3
All species	4,837.7	5,233.9	5,356.2	4,398.2	3,956.7	3,607.2	3,511.8	3,175.7	2,762.8	2,357.8	9,922.1	49,120.1

[1]Includes corkbark fir.

Table 41.--Net volume of growing stock on commercial timberland in the Northern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million cubic feet													
Western Montana														
Douglas-fir	398.3	599.9	672.1	746.6	713.7	620.9	522.3	422.1	288.3	189.3	133.9	78.9	137.3	5,523.6
Ponderosa pine	33.6	90.6	106.0	138.6	155.3	153.3	144.8	145.2	137.0	72.6	84.5	74.7	174.1	1,510.3
Western white pine	9.6	18.0	32.5	33.9	32.4	24.4	19.7	26.1	16.7	13.7	7.0	8.2	17.0	259.2
Lodgepole pine	1,405.3	1,598.5	1,094.5	605.5	254.0	99.1	35.4	13.7	5.5	2.4	--	--	--	5,113.9
Whitebark pine	24.5	55.4	65.8	65.8	49.8	33.5	21.0	11.4	8.5	1.8	5.5	2.2	3.1	348.3
Western larch[1]	153.4	193.7	235.6	232.3	223.7	210.1	197.5	184.9	158.6	139.5	92.5	66.4	179.5	2,267.7
Grand fir	42.4	70.7	66.6	58.2	49.1	29.9	31.5	13.5	6.7	10.6	3.1	3.0	3.6	388.9
Subalpine fir[2]	199.0	270.3	259.3	196.2	148.2	101.8	51.9	36.6	26.6	11.5	3.5	1.1	2.9	1,308.9
White fir	.9	1.8	2.0	.2	1.0	--	--	--	--	--	--	--	--	5.9
Engelmann spruce	92.3	130.8	166.0	193.6	186.0	173.6	148.8	116.7	98.2	55.9	53.9	22.3	73.1	1,511.2
Western hemlock[3]	18.9	46.0	31.5	40.1	29.4	34.9	23.1	18.8	18.3	19.9	13.0	9.1	15.5	318.5
Western redcedar	34.4	38.6	29.0	32.6	26.9	17.5	12.0	16.5	10.2	9.4	11.8	11.3	49.0	299.2
Other softwoods	.1	--	--	.1	--	--	--	--	--	--	--	--	--	.2
Total softwoods	2,412.7	3,114.3	2,760.9	2,343.7	1,869.5	1,499.0	1,208.0	1,005.5	774.6	526.6	408.7	277.2	655.1	18,855.8
Aspen	8.2	7.9	4.2	4.3	1.7	1.5	1.1	.3	--	([4])	--	--	--	29.2
Cottonwood	.2	1.3	.1	3.0	1.3	6.2	4.9	--	7.5	1.8	--	--	--	26.3
Other hardwoods	6.0	5.2	5.3	4.0	5.9	.9	--	.6	--	--	.2	--	.7	28.8
Total hardwoods	14.4	14.4	9.6	11.3	8.9	8.6	6.0	.9	7.5	1.8	.2	--	.7	84.3
All species	2,427.1	3,128.7	2,770.5	2,355.0	1,878.4	1,507.6	1,214.0	1,006.4	782.1	528.4	408.9	277.2	655.8	18,940.1

[1] Includes a negligible amount of alpine larch.
[2] Includes corkbark fir.
[3] Includes mountain hemlock.
[4] Less than 0.05 million cubic feet.

Table 42.--Net volume of sawtimber on commercial timberland in the Northern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, International 1/4-inch rule											
Western Montana												
Douglas-fir	2,511.4	3,409.2	3,515.1	3,229.1	2,807.5	2,318.1	1,643.0	1,066.0	764.9	449.6	797.6	22,511.5
Ponderosa pine	355.4	596.5	854.6	883.1	859.5	902.7	817.4	432.6	489.8	445.9	1,039.1	7,676.6
Western white pine	155.8	181.3	173.2	135.7	110.6	146.9	96.6	81.1	40.5	50.4	105.6	1,277.7
Lodgepole pine	5,015.7	3,234.4	1,411.0	562.4	204.1	73.1	32.2	12.6	--	--	--	10,545.5
Whitebark pine	272.6	318.6	241.0	163.7	106.1	57.3	46.6	9.8	27.9	11.6	14.8	1,270.0
Western larch[1]	1,146.2	1,254.6	1,241.5	1,178.6	1,129.7	1,046.5	927.6	804.5	538.8	378.7	1,032.1	10,678.8
Grand fir	293.7	309.1	285.6	177.9	195.0	91.4	44.5	78.8	23.6	23.3	32.8	1,555.7
Subalpine fir[2]	1,117.9	1,035.7	784.8	541.4	285.4	194.3	142.3	74.6	19.8	7.7	19.4	4,223.3
White fir	9.9	.8	6.5	--	--	--	--	--	--	--	--	17.2
Engelmann spruce	774.1	1,050.7	1,023.9	968.6	829.7	653.6	563.7	332.2	328.7	142.4	477.6	7,145.2
Western hemlock[3]	117.0	190.4	153.3	204.7	139.7	119.2	116.3	128.4	85.0	62.0	122.6	1,438.6
Western redcedar	140.8	188.7	166.0	114.0	79.0	107.1	76.9	78.5	94.9	92.5	454.6	1,593.0
Other softwoods	--	.5	--	--	--	--	--	--	--	--	--	.5
Total softwoods	11,910.5	11,770.5	9,856.5	8,159.2	6,746.3	5,710.2	4,507.1	3,099.1	2,413.9	1,664.1	4,096.2	69,933.6
Aspen	XXXXX	20.4	8.4	7.5	5.3	2.0	--	.2	--	--	--	43.8
Cottonwood	XXXXX	13.8	6.3	30.6	24.7	--	36.0	8.8	--	--	--	120.2
Other hardwoods	XXXXX	20.0	28.7	4.5	--	2.8	--	--	.8	--	3.3	60.1
Total hardwoods	XXXXX	54.2	43.4	42.6	30.0	4.8	36.0	9.0	.8	--	3.3	224.1
All species	11,910.5	11,824.7	9,899.9	8,201.8	6,776.3	5,715.0	4,543.1	3,108.1	2,414.7	1,664.1	4,099.5	70,157.7

[1]Includes a negligible amount of alpine larch.
[2]Includes corkbark fir.
[3]Includes mountain hemlock.

Table 43.--Net volume of growing stock on commercial timberland in the Northern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
Eastern Montana	*Million cubic feet*													
Douglas-fir	222.4	314.5	356.7	335.4	331.9	268.3	219.6	175.4	130.7	87.7	57.6	30.1	68.7	2,599.0
Ponderosa pine	98.2	102.4	125.2	138.4	102.8	102.4	65.2	43.8	31.1	14.7	11.7	13.1	6.0	855.0
Western white pine	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine	866.7	1,116.1	880.6	573.7	321.8	141.5	51.3	25.8	3.9	7.6	.7	1.1	.5	3,991.3
Whitebark and limber pines	59.6	85.3	87.0	71.7	42.7	22.2	14.0	8.9	3.3	2.0	1.0	--	1.1	398.8
Western larch	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir[1]	97.8	90.2	77.6	57.1	37.8	20.1	11.8	3.0	2.3	1.0	.1	--	--	398.8
White fir	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engelmann spruce	25.3	57.1	73.9	81.5	76.5	78.7	58.9	37.7	31.8	22.1	20.7	12.0	15.1	591.3
Western hemlock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	--	--	--	.5	--	--	--	--	--	--	--	--	--	.5
Total softwoods	1,370.0	1,765.6	1,601.0	1,258.3	913.5	633.2	420.8	294.6	203.1	135.1	91.8	56.3	91.4	8,834.7
Aspen	4.8	10.3	9.6	5.1	1.0	1.1	--	.8	--	--	--	--	--	32.7
Cottonwood	--	.7	7.1	17.6	23.7	23.1	22.6	19.2	17.1	14.1	11.1	8.5	1.1	165.9
Other hardwoods	.1	1.4	1.4	--	.2	.3	--	.3	--	--	--	--	--	3.7
Total hardwoods	4.9	12.4	18.1	22.7	24.9	24.5	22.6	20.3	17.1	14.1	11.1	8.5	1.1	202.3
All species	1,374.9	1,778.0	1,619.1	1,281.0	938.4	657.7	443.4	314.9	220.2	149.2	102.9	64.8	92.5	9,037.0

[1]Includes corkbark fir.

Table 44.--Net volume of sawtimber on commercial timberland in the Northern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
Eastern Montana	*Million board feet, International 1/4-inch rule*											
Douglas-fir	1,172.0	1,380.3	1,482.1	1,260.3	1,096.2	910.7	691.7	471.0	310.4	165.3	399.2	9,339.2
Ponderosa pine	313.4	491.9	438.0	478.5	324.9	226.1	162.6	76.6	60.5	63.8	32.8	2,669.1
Western white pine	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine	3,863.4	2,952.2	1,640.5	718.0	255.0	124.7	18.7	38.8	3.5	5.5	3.0	9,623.3
Whitebark and limber pines	349.9	357.6	209.8	105.2	68.6	42.6	16.1	10.9	4.8	--	4.6	1,170.1
Western larch	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir[1]	308.1	278.6	181.9	92.9	54.7	13.0	11.1	4.8	.3	--	--	945.4
White fir	0	0	0	0	0	0	0	0	0	0	0	0
Engelmann spruce	319.7	410.7	382.7	402.2	298.7	193.9	158.2	116.3	115.3	68.9	88.9	2,555.5
Western hemlock	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	--	1.8	--	--	--	--	--	--	--	--	--	1.8
Total softwoods	6,326.5	5,873.1	4,335.0	3,057.1	2,098.1	1,511.0	1,058.4	718.4	494.8	303.5	528.5	26,304.4
Aspen	XXXXX	26.6	6.4	5.5	--	4.3	--	--	--	--	--	42.8
Cottonwood	XXXXX	88.5	122.0	118.5	118.0	100.7	91.0	75.0	59.0	46.0	6.0	824.7
Other hardwoods	XXXXX	--	1.1	1.3	--	1.5	--	--	--	--	--	3.9
Total hardwoods	XXXXX	115.1	129.5	125.3	118.0	106.5	91.0	75.0	59.0	46.0	6.0	871.4
All species	6,326.5	5,988.2	4,464.5	3,182.4	2,216.1	1,617.5	1,149.4	793.4	553.8	349.5	534.5	27,175.8

[1]Includes corkbark fir.

Table 45.--Net volume of growing stock on commercial timberland in the Northern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million cubic feet													
Western South Dakota														
Douglas-fir	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine	126.5	232.7	281.9	271.0	226.7	169.7	116.5	73.2	36.0	17.5	9.6	2.2	1.7	1,565.2
Western white pine	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Whitebark pine	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Western larch	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir	0	0	0	0	0	0	0	0	0	0	0	0	0	0
White fir	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engelmann spruce[1]	6.7	9.2	10.1	9.5	7.9	7.0	4.5	3.2	2.2	.9	.2	.1	--	61.5
Western hemlock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total softwoods	133.2	241.9	292.0	280.5	234.6	176.7	121.0	76.4	38.2	18.4	9.8	2.3	1.7	1,626.7
Aspen	4.6	2.3	1.2	.3	--	--	--	--	--	--	--	--	--	8.4
Cottonwood	--	--	--	--	--	--	.1	([2])	.1	.1	.1	--	.6	1.0
Other hardwoods	2.4	1.4	1.0	.4	.3	.1	.4	.2	.2	([2])	.2	--	.3	6.9
Total hardwoods	7.0	3.7	2.2	.7	.3	.1	.5	.2	.3	.1	.3	--	.9	16.3
All species	140.2	245.6	294.2	281.2	234.9	176.8	121.5	76.6	38.5	18.5	10.1	2.3	2.6	1,643.0

[1] Includes white spruce.
[2] Less than 0.05 million cubic feet.

Table 46.--Net volume of sawtimber on commercial timberland in the Northern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, International 1/4-inch rule											
Western South Dakota												
Douglas-fir	0	0	0	0	0	0	0	0	0	0	0	0
Ponderosa pine	721.2	1,120.5	1,104.5	909.9	668.3	436.6	200.2	99.3	54.5	12.6	10.3	5,337.9
Western white pine	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine	--	--	--	--	--	--	--	--	--	--	--	--
Whitebark pine	0	0	0	0	0	0	0	0	0	0	0	0
Western larch	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir	0	0	0	0	0	0	0	0	0	0	0	0
White fir	0	0	0	0	0	0	0	0	0	0	0	0
Engelmann spruce[1]	53.1	53.8	45.8	41.2	26.4	18.8	12.8	5.4	1.3	.5	--	259.1
Western hemlock	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0
Total softwoods	774.3	1,174.3	1,150.3	951.1	694.7	455.4	213.0	104.7	55.8	13.1	10.3	5,597.0
Aspen	XXXXX	1.5	--	--	--	--	--	--	--	--	--	1.5
Cottonwood	XXXXX	--	--	--	.2	.2	.6	.5	.8	--	3.1	5.4
Other hardwoods	XXXXX	2.3	1.5	.7	2.0	.7	1.1	.3	1.2	--	1.6	11.4
Total hardwoods	XXXXX	3.8	1.5	.7	2.2	.9	1.7	.8	2.0	--	4.7	18.3
All species	774.3	1,178.1	1,151.8	951.8	696.9	456.3	214.7	105.5	57.8	13.1	15.0	5,615.3

[1]Includes white spruce.

Table 47.--Net volume of growing stock on commercial timberland in the Northern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million cubic feet													
Wyoming														
Douglas-fir	62.4	46.7	96.6	54.8	59.5	51.4	49.6	44.6	41.8	32.6	16.2	17.8	34.2	608.2
Ponderosa pine	48.6	96.6	141.0	161.7	132.3	100.0	62.1	41.5	19.7	9.1	4.4	.7	4.4	822.1
Western white pine	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine	393.9	521.5	624.2	500.4	367.7	177.8	118.5	61.6	18.9	8.7	4.8	2.6	2.6	2,803.2
Whitebark and limber pines	14.1	38.6	46.1	61.6	50.2	34.0	23.4	15.6	12.0	7.7	2.4	1.8	3.4	310.9
Western larch	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir[1]	147.0	145.4	148.9	101.5	80.3	61.5	50.3	21.1	14.4	7.4	7.0	2.2	1.7	788.7
White fir	([2])	([2])	.1	.1	([2])	([2])	([2])	.1	.1	([2])	([2])	([2])	([2])	.4
Engelmann spruce[3]	83.6	114.5	130.9	172.1	182.8	189.0	163.9	149.8	108.4	86.1	91.4	43.7	93.4	1,609.6
Western hemlock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	4.0	4.2	4.5	2.8	1.8	1.0	.7	.1	.4	.3	--	--	--	19.8
Total softwoods	753.6	967.5	1,192.3	1,055.0	874.6	614.7	468.5	334.4	215.7	151.9	126.2	68.8	139.7	6,962.9
Aspen	56.3	51.1	51.8	10.7	19.1	7.7	2.3	.1	--	--	--	--	--	199.1
Cottonwood	.1	8.8	.2	22.1	.3	--	--	--	.1	--	--	--	--	31.6
Other hardwoods	.3	.2	.1	([2])	([2])	.1	.1	([2])	.1	--	.1	--	.1	1.1
Total hardwoods	56.7	60.1	52.1	32.8	19.4	7.8	2.4	.1	.2	--	.1	--	.1	231.8
All species	810.3	1,027.6	1,244.4	1,087.8	894.0	622.5	470.9	334.5	215.9	151.9	126.3	68.8	139.8	7,194.7

[1] Includes corkbark fir.
[2] Less than 0.05 million cubic feet.
[3] Includes white spruce.

Table 48.--Net volume of sawtimber on commercial timberland in the Northern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, International 1/4-inch rule											
Wyoming												
Douglas-fir	431.6	259.1	311.8	283.8	288.1	264.7	271.7	206.6	106.7	110.3	215.8	2,750.2
Ponderosa pine	355.4	581.2	565.9	482.8	327.6	229.9	83.8	45.3	21.9	4.2	23.3	2,721.3
Western white pine	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine	3,174.6	2,543.3	1,898.9	929.4	625.9	325.4	95.7	43.5	23.7	13.1	13.0	9,686.5
Whitebark and limber pines	179.3	304.9	249.1	171.7	117.6	74.9	62.3	38.9	12.2	9.1	17.2	1,237.2
Western larch	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir[1]	700.1	491.3	406.0	318.5	266.9	113.1	78.1	40.8	37.7	11.8	9.4	2,473.7
White fir	.1	.3	.1	.2	.2	.3	.2	([2])	.2	.1	.1	1.8
Engelmann spruce[3]	697.8	908.2	980.5	1,021.2	886.9	820.2	607.9	487.3	525.6	257.7	556.6	7,749.9
Western hemlock	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	23.4	15.2	9.9	5.4	4.0	.5	2.2	1.4	--	--	--	62.0
Total softwoods	5,562.3	5,103.5	4,422.2	3,213.0	2,517.2	1,829.0	1,201.9	863.8	728.0	406.3	835.4	26,682.6
Aspen	XXXXX	62.2	135.0	56.9	13.5	.6	--	--	--	--	--	268.2
Cottonwood	XXXXX	122.7	2.4	--	--	--	.4	--	--	--	--	125.5
Other hardwoods	XXXXX	.1	.1	.3	.6	.2	.5	--	.4	--	.7	2.9
Total hardwoods	XXXXX	185.0	137.5	57.2	14.1	.8	.9	--	.4	--	.7	396.6
All species	5,562.3	5,288.5	4,559.7	3,270.2	2,531.3	1,829.8	1,202.8	863.8	728.4	406.3	836.1	27,079.2

[1]Includes corkbark fir.
[2]Less than 0.05 million board feet.
[3]Includes white spruce.

Table 49.--Net volume of growing stock on commercial timberland in the Northern Rocky Mountain States by species and diameter class, 1977

Species	Diameter class (inches)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million cubic feet													
Douglas-fir	1,057.2	1,542.4	1,887.4	1,993.3	2,121.3	1,817.8	1,562.4	1,331.1	1,066.3	803.3	604.9	433.2	1,067.3	17,287.9
Ponderosa pine	349.2	597.2	796.0	899.7	849.3	733.5	580.9	473.4	412.0	301.5	308.4	283.5	1,249.3	7,833.9
Western white pine	57.6	129.9	161.2	224.1	194.2	208.5	215.8	209.4	182.7	162.6	107.6	86.5	231.8	2,171.9
Lodgepole pine	3,370.7	4,282.1	3,552.6	2,318.1	1,277.8	596.5	291.4	130.7	45.2	25.1	8.3	5.7	4.0	15,908.2
Whitebark and limber pines	107.9	199.8	221.0	219.6	166.1	115.8	68.2	46.2	30.4	14.0	10.7	5.2	11.3	1,216.2
Western larch[1]	275.1	372.8	429.1	410.5	400.9	351.5	321.5	282.9	266.9	213.1	143.4	101.1	307.2	3,876.0
Grand fir	272.3	426.8	500.4	536.2	534.6	463.1	447.2	355.6	281.8	273.8	240.0	187.2	530.6	5,049.6
Subalpine fir[2]	635.2	794.9	833.8	639.6	525.7	414.1	293.2	182.9	135.3	71.4	42.5	15.8	23.4	4,607.8
White fir	2.5	4.6	5.1	6.1	7.8	6.9	8.2	6.6	5.5	6.0	5.6	4.0	32.5	101.4
Engelmann spruce[3]	264.3	417.6	524.9	640.8	669.7	670.4	593.9	521.1	433.9	329.8	277.0	157.9	392.0	5,893.3
Western hemlock[4]	68.2	141.9	160.1	164.1	169.9	155.9	136.6	106.1	84.1	79.2	51.7	36.7	102.8	1,457.3
Western redcedar	121.8	167.7	203.3	216.4	221.1	180.0	175.8	181.4	135.7	110.4	100.3	101.7	390.1	2,305.7
Pinyon/juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other softwoods	56.1	164.2	4.5	3.4	1.8	1.0	.7	.1	.4	.3	--	--	--	232.5
Total softwoods	6,638.1	9,241.9	9,279.4	8,271.9	7,140.2	5,715.0	4,695.8	3,827.5	3,080.2	2,390.5	1,900.4	1,418.5	4,342.3	67,941.7
Aspen	89.9	92.2	82.1	36.5	29.7	11.5	4.0	1.2	--	--	--	--	--	347.1
Cottonwood	.5	11.5	12.1	48.9	35.4	39.8	35.9	25.8	30.2	20.3	14.2	11.6	9.8	296.0
Other hardwoods	39.8	26.6	20.7	8.1	7.9	1.5	1.2	1.1	.3	([5])	1.2	--	5.3	113.7
Total hardwoods	130.2	130.3	114.9	93.5	73.0	52.8	41.1	28.1	30.5	20.3	15.4	11.6	15.1	756.8
All species	6,768.3	9,372.2	9,394.3	8,365.4	7,213.2	5,767.8	4,736.9	3,855.6	3,110.7	2,410.8	1,915.8	1,430.1	4,357.4	68,698.5

[1] Includes a negligible amount of alpine larch.
[2] Includes corkbark fir.
[3] Includes white spruce
[4] Includes mountain hemlock
[5] Less than 0.05 million cubic feet.

Table 50.--Net volume of sawtimber on commercial timberland in the Northern Rocky Mountain States by species and diameter class, 1977

Species	Diameter class (inches)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, International 1/4-inch rule											
Douglas-fir	7,370.6	9,253.0	10,444.5	9,261.2	8,207.5	7,165.2	5,955.1	4,494.4	3,442.6	2,499.1	6,171.1	74,264.3
Ponderosa pine	2,219.0	3,639.7	4,142.1	3,866.3	3,245.2	2,775.6	2,336.5	1,736.8	1,771.6	1,650.1	7,502.0	34,884.9
Western white pine	791.6	1,178.5	1,009.9	1,062.0	1,087.8	1,078.3	967.2	858.2	574.5	471.9	1,326.6	10,406.5
Lodgepole pine	16,230.2	12,132.0	6,704.1	3,127.6	1,525.9	675.5	231.7	128.9	42.5	29.8	20.9	40,849.1
Whitebark and limber pines	896.5	1,085.7	822.9	576.4	342.3	225.1	158.8	72.1	54.1	27.3	55.6	4,316.8
Western larch[1]	2,210.0	2,288.0	2,225.0	1,949.1	1,784.2	1,552.6	1,516.6	1,207.9	810.5	556.4	1,685.3	17,785.6
Grand fir	2,160.1	2,699.0	2,778.1	2,448.6	2,419.5	1,931.7	1,570.4	1,575.5	1,394.4	1,137.3	3,270.4	23,385.0
Subalpine fir[2]	3,626.1	3,227.4	2,676.7	2,096.4	1,520.2	941.3	719.3	400.7	234.2	87.5	132.1	15,661.9
White fir	23.6	31.0	42.1	35.8	42.6	33.8	29.7	32.9	31.2	22.1	179.5	504.3
Engelmann spruce[3]	2,490.9	3,394.2	3,563.0	3,589.2	3,173.5	2,801.3	2,396.4	1,880.6	1,618.0	938.3	2,311.9	28,157.3
Western hemlock[4]	593.0	761.2	844.9	841.2	761.7	612.3	516.1	519.5	342.9	268.8	811.1	6,872.7
Western redcedar	898.5	1,020.5	1,053.6	866.6	843.6	870.6	686.9	586.0	558.2	577.5	2,452.6	10,414.6
Pinyon/juniper	--	--	--	--	--	--	--	--	--	--	--	--
Other softwoods	23.4	17.5	9.9	5.4	4.0	.5	2.2	1.4	--	--	--	64.3
Total softwoods	39,533.5	40,727.7	36,316.8	29,725.8	24,958.0	20,663.8	17,086.9	13,494.9	10,874.7	8,266.1	25,919.1	267,567.3
Aspen	XXXXX	187.1	186.9	75.3	21.2	6.9	--	.2	--	--	--	477.6
Cottonwood	XXXXX	260.5	186.6	207.9	189.3	137.7	158.4	109.3	77.6	65.0	68.1	1,460.4
Other hardwoods	XXXXX	47.1	41.1	7.1	5.5	5.2	1.6	.3	8.0	--	24.6	140.5
Total hardwoods	XXXXX	494.7	414.6	290.3	216.0	149.8	160.0	109.8	85.6	65.0	92.7	2,078.5
All species	39,533.5	41,222.4	36,731.4	30,016.1	25,174.0	20,813.6	17,246.9	13,604.7	10,960.3	8,331.1	26,011.8	269,645.8

[1]Includes a negligible amount of alpine larch
[2]Includes corkbark fir.
[3]Includes white spruce.
[4]Includes mountain hemlock.

Table 51.--Net volume of growing stock on commercial timberland in the Southern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
Arizona	*Million cubic feet*													
Douglas-fir	17.1	17.2	21.5	23.8	29.0	28.7	28.5	24.4	20.9	28.7	18.4	14.7	63.9	336.8
Ponderosa pine[1]	143.2	178.7	250.1	293.6	314.1	335.1	378.7	368.2	359.0	345.2	287.7	243.7	345.1	3,842.4
Western white pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole pine	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limber pine[2]	3.2	5.2	3.7	7.2	5.8	5.7	5.8	5.1	4.9	3.6	3.4	2.2	6.4	62.2
Western larch	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir[3]	2.8	4.3	9.9	7.8	8.0	8.8	6.4	2.7	3.2	2.5	1.3	.4	1.9	60.0
White fir	5.5	6.1	12.6	12.1	20.0	15.0	10.7	16.1	8.3	6.0	7.1	14.6	32.7	166.8
Engelmann spruce	10.6	14.1	16.8	38.2	40.3	47.0	32.9	36.7	20.3	14.3	10.8	4.7	7.7	294.4
Western hemlock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	182.4	225.6	314.6	382.7	417.2	440.3	463.0	453.2	416.6	400.3	328.7	280.3	457.7	4,762.6
Aspen	27.8	32.2	33.7	39.0	32.0	21.2	16.3	9.2	6.0	1.0	.8	.3	.1	219.6
Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	27.8	32.2	33.7	39.0	32.0	21.2	16.3	9.2	6.0	1.0	.8	.3	.1	219.6
All species	210.2	257.8	348.3	421.7	449.2	461.5	479.3	462.4	422.6	401.3	329.5	280.6	457.8	4,982.2

[1] Includes a negligible amount of Apache, Arizona, and Chihuahua pines.
[2] Includes a negligible amount of Mexican white and bristlecone pines.
[3] Includes corkbark fir.

Table 52.--Net volume of sawtimber on commercial timberland in the Southern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
Arizona	*Million board feet, International 1/4-inch rule*											
Douglas-fir	90.7	112.5	148.4	151.6	153.7	124.0	111.5	156.2	101.8	82.2	364.1	1,596.7
Ponderosa pine[1]	656.2	1,053.8	1,333.5	1,554.7	1,890.0	1,930.2	1,956.8	1,942.9	1,645.6	1,419.5	2,125.7	17,508.9
Western white pine	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole pine	0	0	0	0	0	0	0	0	0	0	0	0
Limber pine[2]	19.7	38.0	30.6	30.6	32.3	29.0	27.4	20.5	18.6	12.1	34.9	293.7
Western larch	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir[3]	43.9	37.7	40.8	48.5	35.8	15.8	19.3	15.5	8.5	1.9	11.7	279.4
White fir	52.8	57.7	106.7	82.1	60.7	95.9	49.0	30.9	40.0	85.3	177.9	839.0
Engelmann spruce	97.1	203.5	220.1	263.5	189.4	221.0	121.3	87.0	65.4	28.4	48.6	1,545.3
Western hemlock	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	960.4	1,503.2	1,880.1	2,131.0	2,361.9	2,415.9	2,285.3	2,253.0	1,879.9	1,629.4	2,762.9	22,063.0
Aspen	XXXXX	194.8	163.4	109.4	86.9	50.3	31.9	5.1	4.1	1.6	.2	647.7
Cottonwood	XXXXX	--	--	--	--	--	--	--	--	--	--	--
Other hardwoods	XXXXX	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	XXXXX	194.8	163.4	109.4	86.9	50.3	31.9	5.1	4.1	1.6	.2	647.7
All species	960.4	1,698.0	2,043.5	2,240.4	2,448.8	2,466.2	2,317.2	2,258.1	1,884.0	1,631.0	2,763.1	22,710.7

[1]Includes a negligible amount of Apache, Arizona, and Chihuahua pine.
[2]Includes a negligible amount of Mexican white and bristlecone pines.
[3]Includes corkbark fir.

Table 53.--Net volume of growing stock on commercial timberland in the Southern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
Colorado	*Million cubic feet*													
Douglas-fir	237.2	138.0	130.9	111.6	107.1	113.8	87.6	74.3	60.4	31.7	26.9	21.7	46.7	1,187.9
Ponderosa pine	47.4	66.2	72.0	112.5	113.2	93.1	71.6	75.8	62.8	58.1	36.1	28.0	54.2	891.0
Western white pine	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine	769.4	654.8	574.2	464.7	316.6	155.0	80.3	35.9	9.0	6.2	.5	.9	--	3,067.5
Limber pine[1]	20.2	8.8	7.7	5.8	5.0	3.6	5.0	3.8	.5	1.3	([2])	.1	--	61.8
Western larch	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir	358.4	321.6	296.7	237.1	181.8	156.4	115.0	69.5	36.1	22.2	10.0	5.8	1.3	1,811.9
White fir	16.8	24.4	25.8	26.1	22.9	20.1	19.4	14.0	15.6	18.3	10.3	13.2	21.0	247.9
Engelmann spruce[3]	407.2	452.2	591.3	650.0	642.8	622.4	539.0	412.6	342.7	242.6	160.4	106.2	132.3	5,301.7
Western hemlock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	10.8	7.4	10.7	7.4	7.9	4.5	2.2	.6	1.5	.2	.3	.3	--	53.8
Total softwoods	1,867.4	1,673.4	1,709.3	1,615.2	1,397.3	1,168.9	920.1	686.5	528.6	380.6	244.5	176.2	255.5	12,623.5
Aspen	338.9	640.6	567.1	351.8	200.8	108.2	59.9	30.5	5.9	6.2	([2])	.3	--	2,310.2
Cottonwood	.3	9.0	14.4	21.6	14.4	11.7	8.1	4.5	5.8	4.0	3.7	3.5	--	101.0
Other hardwoods	--	.3	.5	.4	--	--	--	([2])	--	([2])	--	--	--	1.2
Total hardwoods	339.2	649.9	582.0	373.8	215.2	119.9	68.0	35.0	11.7	10.2	3.7	3.8	--	2,412.4
All species	2,206.6	2,323.3	2,291.3	1,989.0	1,612.5	1,288.8	988.1	721.5	540.3	390.8	248.2	180.0	255.5	15,035.9

[1]Includes a negligible amount of bristlecone pine.
[2]Less than 0.05 million cubic feet.
[3]Includes blue spruce.

Table 54.--Net volume of sawtimber on commercial timberland in the Southern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
Colorado	*Million board feet, International 1/4-inch rule*											
Douglas-fir	676.2	539.7	582.9	656.5	522.1	455.0	399.0	198.3	169.5	133.0	283.2	4,615.4
Ponderosa pine	137.9	395.8	551.6	513.3	426.5	464.7	290.3	308.4	201.9	163.3	341.0	3,794.7
Western white pine	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine	3,090.0	2,397.0	1,700.9	855.1	450.2	208.0	52.0	37.8	2.4	4.8	--	8,798.2
Limber pine[1]	64.5	34.5	30.7	21.8	30.9	24.2	3.4	8.9	.1	.4	--	219.4
Western larch	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir	1,590.0	1,237.7	977.2	858.5	636.5	386.1	211.4	126.3	56.0	33.0	10.1	6,122.8
White fir	137.3	125.9	122.5	111.6	113.1	82.0	94.8	112.1	60.6	79.3	122.8	1,162.0
Engelmann spruce[2]	3,474.8	3,616.7	3,631.8	3,556.9	3,113.1	2,379.4	2,033.6	1,483.9	994.4	664.6	847.9	25,797.1
Western hemlock	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	52.0	34.8	39.4	23.2	10.9	3.1	7.2	.9	1.4	1.5	--	174.4
Total softwoods	9,222.7	8,382.1	7,637.0	6,596.9	5,303.3	4,002.5	3,091.7	2,276.6	1,486.3	1,079.9	1,605.0	50,684.0
Aspen	XXXXX	1,780.3	1,027.5	570.2	325.9	168.6	32.0	34.9	.1	2.0	--	3,941.5
Cottonwood	XXXXX	79.7	59.4	50.0	33.9	18.4	24.9	16.7	15.4	14.6	--	313.0
Other hardwoods	XXXXX	1.7	--	--	--	.2	--	.1	--	--	--	2.0
Total hardwoods	XXXXX	1,861.7	1,086.9	620.2	359.8	187.2	56.9	51.7	15.5	16.6	--	4,256.5
All species	9,222.7	10,243.8	8,723.9	7,217.1	5,663.1	4,189.7	3,148.6	2,328.3	1,501.8	1,096.5	1,605.0	54,940.5

[1]Includes a negligible amount of bristlecone pine.
[2]Includes blue spruce.

Table 55.--Net volume of growing stock on commercial timberland in the Southern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million cubic feet													
Nevada														
Douglas-fir	([1])	--	--	--	--	--	--	--	--	--	--	--	--	([1])
Ponderosa pine[2]	.4	1.7	2.9	4.6	5.5	7.3	7.8	7.4	6.7	7.3	6.3	4.8	22.2	84.9
Sugar pine	--	--	--	--	.1	--	--	.1	--	--	--	--	.8	1.0
Western white pine	.1	.2	.1	.3	.5	.4	.4	.7	.5	.7	1.3	1.1	6.0	12.3
Lodgepole pine	.3	.9	1.5	2.1	2.5	2.0	1.3	1.8	2.0	1.5	1.1	1.0	2.5	20.5
Whitebark pine	1.2	.3	.3	.5	.2	.6	1.3	.6	1.1	1.1	.2	.5	.7	8.6
Western larch	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir[3]	.8	.6	1.2	.5	.5	.7	.1	.7	--	--	--	--	--	5.1
White fir	.9	1.2	2.0	2.2	3.0	3.9	5.0	4.9	6.0	5.7	6.0	5.8	40.3	86.9
Engelmann spruce	.5	1.1	1.5	1.8	.8	2.4	.9	1.7	1.6	1.6	1.6	2.7	1.6	19.8
Mountain hemlock	([1])	.1	.1	.1	.1	.2	.4	.2	.3	.6	.5	.5	1.6	4.7
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods[4]	.2	.1	.1	.2	.2	.2	.3	.2	.4	.2	.2	.3	2.9	5.5
Total softwoods	4.4	6.2	9.7	12.3	13.4	17.7	17.5	18.3	18.6	18.7	17.2	16.7	78.6	249.3
Aspen	3.0	2.1	2.1	3.4	1.5	.1	.1	.1	([1])	--	--	--	--	12.4
Cottonwood	--	--	--	.4	.2	--	--	--	([1])	--	--	--	--	.6
Other hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	3.0	2.1	2.1	3.8	1.7	.1	.1	.1	([1])	--	--	--	--	13.0
All species	7.4	8.3	11.8	16.1	15.1	17.8	17.6	18.4	18.6	18.7	17.2	16.7	78.6	262.3

([1]) Less than 0.05 million cubic feet.
[2] Includes Jeffrey pine.
[3] Includes corkbark fir.
[4] Includes Sierra juniper, red fir, and incense cedar.

Table 56.--Net volume of sawtimber on commercial timberland in the Southern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, International 1/4-inch rule											
Nevada												
Douglas-fir	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa pine[1]	5.4	14.6	23.6	36.5	43.5	43.5	40.2	43.9	36.1	28.3	139.0	454.6
Sugar pine	--	--	.3	--	--	.5	--	--	--	--	5.1	5.9
Western white pine	.5	1.5	2.4	2.4	2.1	4.3	3.1	4.4	7.8	6.5	37.4	72.4
Lodgepole pine	7.9	11.1	13.1	10.5	7.4	10.2	11.5	8.3	5.6	5.2	11.8	102.6
Whitebark pine	1.3	2.2	1.3	4.0	6.9	3.8	6.2	6.1	1.3	2.6	4.0	39.7
Western larch	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir[2]	5.7	2.8	2.4	3.8	.5	3.5	--	--	--	--	--	18.7
White fir	7.6	9.8	14.9	20.6	29.7	29.9	37.0	36.0	38.0	35.0	258.6	517.1
Engelmann spruce	7.1	9.6	4.1	12.6	4.8	8.5	8.5	8.6	8.8	14.4	9.0	96.0
Mountain hemlock	.4	.5	.5	1.0	1.8	1.0	1.6	3.8	3.3	3.2	9.8	26.9
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods[3]	.4	.5	.8	1.1	1.5	1.1	2.4	1.1	1.4	2.3	16.6	29.2
Total softwoods	36.3	52.6	63.4	92.5	98.2	106.3	110.5	112.2	102.3	97.5	491.3	1,363.1
Aspen	XXXXX	14.9	6.6	.4	.4	.2	.1	--	--	--	--	22.6
Cottonwood	XXXXX	1.8	.8	--	--	--	([4])	--	--	--	--	2.6
Other hardwoods	XXXXX	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	XXXXX	16.7	7.4	.4	.4	.2	.1	--	--	--	--	25.2
All species	36.3	69.3	70.8	92.9	98.6	106.5	110.6	112.2	102.3	97.5	491.3	1,388.3

[1]Includes Jeffrey pine.
[2]Includes corkbark fir.
[3]Includes Sierra juniper, red fir, and incense cedar.
[4]Less than 0.05 million board feet.

Table 57.--Net volume of growing stock on commercial timberland in the Southern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million cubic feet													
New Mexico														
Douglas-fir	78.1	91.6	78.0	94.5	110.3	98.0	93.9	91.5	64.8	57.5	35.9	29.8	80.4	1,004.3
Ponderosa pine[1]	169.9	187.6	169.4	232.4	272.4	415.6	427.6	379.0	320.5	267.4	221.2	155.7	147.8	3,366.5
Western white pine	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limber pine[2]	17.0	26.5	13.4	33.4	22.4	20.3	8.4	9.7	6.0	2.3	3.4	3.3	3.6	169.7
Western larch	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir[3]	27.9	22.5	24.2	28.4	24.0	15.7	12.0	4.4	8.8	1.7	1.5	2.6	5.1	178.8
White fir	75.3	47.0	52.2	55.2	50.9	45.8	38.6	30.5	26.8	21.3	13.1	9.9	21.8	488.4
Engelmann spruce	54.2	54.0	70.0	85.7	68.5	79.8	68.0	41.4	31.0	20.6	5.7	3.3	6.1	588.3
Western hemlock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	422.4	429.2	407.2	529.6	548.5	675.2	648.5	556.5	457.9	370.8	280.8	204.6	264.8	5,796.0
Aspen	101.9	120.0	108.7	95.0	65.6	48.4	32.2	17.8	9.5	.1	--	--	--	599.2
Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	101.9	120.0	108.7	95.0	65.6	48.4	32.2	17.8	9.5	.1	--	--	--	599.2
All species	524.3	549.2	515.9	624.6	614.1	723.6	680.7	574.3	467.4	370.9	280.8	204.6	264.8	6,395.2

[1] Includes a negligible amount of Apache, Arizona, and Chihuahua pines.
[2] Includes a negligible amount of Mexican white and bristlecone pines.
[3] Includes corkbark fir.

Table 58.--Net volume of sawtimber on commercial timberland in the Southern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, International 1/4-inch rule											
New Mexico												
Douglas-fir	440.4	481.9	626.6	575.9	584.2	548.3	373.6	339.3	208.0	181.6	449.8	4,809.6
Ponderosa pine[1]	400.2	717.1	1,030.4	1,825.2	1,997.4	1,880.6	1,678.9	1,443.7	1,221.0	868.0	862.9	13,925.4
Western white pine	0	0	0	0	0	0	0	0	0	0	0	0
Lodgepole pine	0	0	0	0	0	0	0	0	0	0	0	0
Limber pine[2]	80.5	153.6	106.0	102.2	44.0	52.6	33.6	12.0	19.5	18.0	20.4	642.4
Western larch	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir[3]	110.1	129.0	114.6	81.6	64.3	25.9	50.7	10.3	8.8	15.6	30.8	641.7
White fir	194.9	219.9	238.3	229.2	202.6	161.9	138.0	107.8	70.2	51.6	112.8	1,727.2
Engelmann spruce	424.4	421.6	358.8	432.4	374.0	224.4	168.3	113.1	29.4	16.6	36.3	2,599.3
Western hemlock	0	0	0	0	0	0	0	0	0	0	0	0
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	1,650.5	2,123.1	2,474.7	3,246.5	3,266.5	2,893.7	2,443.1	2,026.2	1,556.9	1,151.4	1,513.0	24,345.6
Aspen	XXXXX	533.0	387.0	288.3	193.9	110.6	59.9	.7	--	--	--	1,573.4
Cottonwood	XXXXX	--	--	--	--	--	--	--	--	--	--	--
Other hardwoods	XXXXX	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	XXXXX	533.0	387.0	288.3	193.9	110.6	59.9	.7	--	--	--	1,573.4
All species	1,650.5	2,656.1	2,861.7	3,534.8	3,460.4	3,004.3	2,503.0	2,026.9	1,556.9	1,151.4	1,513.0	25,919.0

[1]Includes a negligible amount of Apache, Arizona, and Chihuahua pines.
[2]Includes a negligible amount of Mexican white and bristlecone pines.
[3]Includes corkbark fir.

Table 59.--Net volume of growing stock on commercial timberland in the Southern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million cubic feet													
Utah														
Douglas-fir	29.6	57.4	64.9	71.9	73.8	63.0	52.4	45.4	37.8	29.3	19.0	10.6	44.4	599.5
Ponderosa pine	2.7	9.7	16.8	20.3	25.6	28.0	26.6	29.9	27.5	26.9	23.4	18.7	61.0	317.1
Lodgepole pine	118.6	170.0	172.8	130.7	92.9	49.9	30.7	14.9	6.9	3.7	1.3	.8	.7	793.9
Limber pine	3.9	5.2	5.8	6.7	5.1	3.9	6.5	3.3	1.3	4.0	1.6	1.3	1.2	49.8
Subalpine fir	88.9	99.7	104.2	89.3	72.9	60.6	47.5	29.7	22.7	13.9	8.6	5.0	3.2	646.2
White fir	28.8	31.1	31.6	26.0	30.4	26.0	26.7	17.2	12.2	11.0	5.0	4.4	9.5	259.9
Engelmann spruce	52.7	86.7	96.2	97.9	110.2	92.5	94.5	70.9	55.6	51.7	43.6	27.9	52.0	932.4
Pinyon/juniper	.5	.7	1.2	.9	.7	1.0	2.4	1.0	.5	.3	.1	.3	.7	10.3
Total softwoods	325.7	460.5	493.5	443.7	411.6	324.9	287.3	212.3	164.5	140.8	102.6	69.0	172.7	3,609.1
Aspen	155.3	179.4	133.8	119.8	72.5	43.0	22.8	6.1	4.7	3.2	1.1	.5	--	742.2
Cottonwood	.1	.4	.8	1.8	1.9	1.7	1.5	1.0	1.3	.2	.3	.4	.5	11.9
Other hardwoods	.1	.1	--	--	--	--	--	--	--	--	--	--	--	.2
Total hardwoods	155.5	179.9	134.6	121.6	74.4	44.7	24.3	7.1	6.0	3.4	1.4	.9	.5	754.3
All species	481.2	640.4	628.1	565.3	486.0	369.6	311.6	219.4	170.5	144.2	104.0	69.9	173.2	4,363.4

Table 60.--Net volume of sawtimber on commercial timberland in the Southern Rocky Mountain States by species and diameter class, 1977

State and species	Diameter class (inches)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, International 1/4-inch rule											
Utah												
Douglas-fir	257.1	347.8	384.3	337.3	304.9	255.8	221.4	180.4	118.1	71.9	315.5	2,794.5
Ponderosa pine	40.5	80.1	124.4	148.2	150.6	175.6	165.4	166.0	144.0	117.1	390.8	1,702.7
Lodgepole pine	689.2	656.1	471.1	253.5	155.5	75.5	35.4	18.8	7.0	3.9	4.0	2,370.0
Limber pine	25.6	31.9	26.1	20.9	35.1	18.5	6.9	22.2	8.8	7.6	6.7	210.3
Subalpine fir	445.7	412.1	351.3	293.9	232.8	149.2	116.1	72.3	44.6	25.8	16.9	2,160.7
White fir	112.8	112.3	145.8	132.0	137.9	89.3	64.6	59.6	27.6	22.6	52.1	956.6
Engelmann spruce	451.9	505.0	574.1	485.6	498.5	374.4	306.9	287.4	240.2	154.3	295.5	4,173.8
Pinyon/juniper	3.7	2.7	2.8	2.9	7.2	2.6	2.1	.8	.2	.9	2.0	27.9
Total softwoods	2,026.5	2,148.0	2,079.9	1,674.3	1,522.5	1,140.9	918.8	807.5	590.5	404.1	1,083.5	14,396.5
Aspen	XXXXX	555.4	342.5	211.2	112.4	29.9	24.1	16.7	6.0	3.1	--	1,301.3
Cottonwood	XXXXX	9.4	9.4	8.5	7.3	4.7	6.1	.9	1.4	2.0	2.2	51.9
Other hardwoods	XXXXX	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	XXXXX	564.8	351.9	219.7	119.7	34.6	30.2	17.6	7.4	5.1	2.2	1,353.2
All species	2,026.5	2,712.8	2,431.8	1,894.0	1,642.2	1,175.5	949.0	825.1	597.9	409.2	1,085.7	15,749.7

Table 61.--Net volume of growing stock on commercial timberland in the Southern Rocky Mountain States by species and diameter class, 1977

Species	Diameter class (inches)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million cubic feet													
Douglas-fir	362.0	304.2	295.3	301.8	320.2	303.5	262.4	235.6	183.9	147.2	100.2	76.8	235.4	3,128.5
Ponderosa pine[1]	363.6	443.9	511.2	663.4	730.9	879.1	912.3	860.4	776.5	704.9	574.7	450.9	631.1	8,502.9
Western white pine	.1	.2	.1	.3	.5	.4	.4	.7	.5	.7	1.3	1.1	6.0	12.3
Lodgepole pine	888.3	825.7	748.5	597.5	412.0	206.9	112.3	52.6	17.9	11.4	2.9	2.7	3.2	3,881.9
Whitebark and limber pines[2]	45.5	46.0	30.9	53.6	38.5	34.1	27.0	22.5	13.8	12.3	8.6	7.4	11.9	352.1
Western larch	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir[3]	478.8	448.7	436.2	363.1	287.2	242.2	181.0	107.0	70.8	40.3	21.4	13.8	11.5	2,702.0
White fir	127.3	109.8	124.2	121.6	127.2	110.8	100.4	82.7	68.9	62.3	41.5	47.9	125.3	1,249.9
Engelmann spruce[4]	525.2	608.1	775.8	873.6	862.6	844.1	735.3	563.3	451.2	330.8	222.1	144.8	199.7	7,136.6
Mountain hemlock	([5])	.1	.1	.1	.1	.2	.4	.2	.3	.6	.5	.5	1.6	4.7
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pinyon/juniper	.5	.7	1.2	.9	.7	1.0	2.4	1.0	.5	.3	.1	.3	.7	10.3
Other softwoods[6]	11.0	7.5	10.8	7.6	8.1	4.7	2.5	.8	1.9	.4	.5	.6	2.9	59.3
Total softwoods	2,802.3	2,794.9	2,934.3	2,983.5	2,788.0	2,627.0	2,336.4	1,926.8	1,586.2	1,311.2	973.8	746.8	1,229.3	27,040.5
Aspen	626.9	974.3	845.4	609.0	372.4	220.9	131.3	63.7	26.1	10.5	1.9	1.1	.1	3,883.6
Cottonwood	.4	9.4	15.2	23.8	16.5	13.4	9.6	5.5	7.1	4.2	4.0	3.9	.5	113.5
Other hardwoods	.1	.4	.5	.4	--	--	--	([5])	--	([5])	--	--	--	1.4
Total hardwoods	627.4	984.1	861.1	633.2	388.9	234.3	140.9	69.2	33.2	14.7	5.9	5.0	.6	3,998.5
All species	3,429.7	3,779.0	3,795.4	3,616.7	3,176.9	2,861.3	2,477.3	1,996.0	1,619.4	1,325.9	979.7	751.8	1,229.9	31,039.0

[1] Includes a negligible amount of Apache, Arizona, Chihuahua, Jeffrey, and sugar pines.
[2] Includes a negligible amount of Mexican white and bristlecone pines.
[3] Includes corkbark fir.
[4] Includes blue spruce
[5] Less than 0.05 million cubic feet
[6] Includes a negligible amount of Sierra juniper, red fir, and incense cedar.

Table 62.--Net volume of sawtimber on commercial timberland in the Southern Rocky Mountain States by species and diameter class, 1977

Species	Diameter class (inches)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, International 1/4-inch rule											
Douglas-fir	1,464.4	1,481.9	1,742.2	1,721.3	1,564.9	1,383.1	1,105.5	874.2	597.4	468.7	1,412.6	13,816.2
Ponderosa pine[1]	1,240.2	2,261.4	3,063.8	4,077.9	4,508.0	4,495.1	4,131.6	3,904.9	3,248.6	2,596.2	3,864.5	37,392.2
Western white pine	.5	1.5	2.4	2.4	2.1	4.3	3.1	4.4	7.8	6.5	37.4	72.4
Lodgepole pine	3,787.1	3,064.2	2,185.1	1,119.1	613.1	293.7	98.9	64.9	15.0	13.9	15.8	11,270.8
Whitebark and limber pines[2]	191.6	260.2	194.7	179.5	149.2	128.1	77.5	69.7	48.3	40.7	66.0	1,405.5
Western larch	0	0	0	0	0	0	0	0	0	0	0	0
Grand fir	0	0	0	0	0	0	0	0	0	0	0	0
Subalpine fir[3]	2,195.4	1,819.3	1,486.3	1,286.3	969.9	580.5	397.5	224.4	117.9	76.3	69.5	9,223.3
White fir	505.4	525.6	628.2	575.5	544.0	459.0	383.4	346.4	236.4	273.8	724.2	5,201.9
Engelmann spruce[4]	4,455.3	4,756.4	4,788.9	4,751.0	4,179.8	3,207.7	2,638.6	1,980.0	1,338.2	878.3	1,237.3	34,211.5
Mountain hemlock	.4	.5	.5	1.0	1.8	1.0	1.6	3.8	3.3	3.2	9.8	26.9
Western redcedar	0	0	0	0	0	0	0	0	0	0	0	0
Pinyon/juniper	3.7	2.7	2.8	2.9	7.2	2.6	2.1	.8	.2	.9	2.0	27.9
Other softwoods[5]	52.4	35.3	40.2	24.3	12.4	4.2	9.6	2.0	2.8	3.8	16.6	203.6
Total softwoods	13,896.4	14,209.0	14,135.1	13,741.2	12,552.4	10,559.3	8,849.4	7,475.5	5,615.9	4,362.3	7,455.7	112,852.2
Aspen	XXXXX	3,078.4	1,927.0	1,179.5	719.5	359.6	148.0	57.4	10.2	6.7	.2	7,486.5
Cottonwood	XXXXX	90.9	69.6	58.5	41.2	23.1	31.0	17.6	16.8	16.6	2.2	367.5
Other hardwoods	XXXXX	1.7	--	--	--	.2	--	.1	--	--	--	2.0
Total hardwoods	XXXXX	3,171.0	1,996.6	1,238.0	760.7	382.9	179.0	75.1	27.0	23.3	2.4	7,856.0
All species	13,896.4	17,380.0	16,131.7	14,979.2	13,313.1	10,942.2	9,028.4	7,550.6	5,642.9	4,385.6	7,458.1	120,708.2

[1]Includes a negligible amount of Apache, Arizona, Chihuahua, Jeffrey, and sugar pines
[2]Includes a negligible amount of Mexican white and bristlecone pines.
[3]Includes corkbark fir.
[4]Includes blue spruce.
[5]Includes a negligible amount of Sierra juniper, red fir, and incense cedar.

Table 63.--Net volume of growing stock on commercial timberland in the Rocky Mountain States by species and diameter class, 1977

Species	Diameter class (inches)												
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million cubic feet													
Douglas-fir	1,419.2	1,846.6	2,182.7	2,295.1	2,441.5	2,121.3	1,824.8	1,566.7	1,250.2	950.5	705.1	510.0	1,302.7	20,416.4
Ponderosa pine	712.8	1,041.1	1,307.2	1,563.1	1,580.2	1,612.6	1,493.2	1,333.8	1,188.5	1,006.4	883.1	734.4	1,880.4	16,336.8
Western white pine	57.7	130.1	161.3	224.4	194.7	208.9	216.2	210.1	183.2	163.3	108.9	87.6	237.8	2,184.2
Lodgepole pine	4,259.0	5,107.8	4,301.1	2,915.6	1,689.8	803.4	403.7	183.3	63.1	36.5	11.2	8.4	7.2	19,790.1
Whitebark and limber pines	153.4	245.8	251.9	273.2	204.6	149.9	95.2	68.7	44.2	26.3	19.3	12.6	23.2	1,568.3
Western larch	275.1	372.8	429.1	410.5	400.9	351.5	321.5	282.9	266.9	213.1	143.4	101.1	307.2	3,876.0
Grand fir	272.3	426.8	500.4	536.2	534.6	463.1	447.2	355.6	281.8	273.8	240.0	187.2	530.6	5,049.6
Subalpine fir	1,114.0	1,243.6	1,270.0	1,002.7	812.9	656.3	474.2	289.9	206.1	111.7	63.9	29.6	34.9	7,309.8
White fir	129.8	114.4	129.3	127.7	135.0	117.7	108.6	89.3	74.4	68.3	47.1	51.9	157.8	1,351.3
Engelmann spruce	789.5	1,025.7	1,300.7	1,514.4	1,532.3	1,514.5	1,329.2	1,084.4	885.1	660.6	499.1	302.7	591.7	13,029.9
Western and mountain hemlock	68.2	142.0	160.2	164.2	170.0	156.1	137.0	106.3	84.4	79.8	52.2	37.2	104.4	1,462.0
Western redcedar	121.8	167.7	203.3	216.4	221.1	180.0	175.8	181.4	135.7	110.4	100.3	101.7	390.1	2,305.7
Pinyon/juniper	.5	.7	1.2	.9	.7	1.0	2.4	1.0	.5	.3	.1	.3	.7	10.3
Other softwoods	67.1	171.7	15.3	11.0	9.9	5.7	3.2	.9	2.3	.7	.5	.6	2.9	291.8
Total softwoods	9,440.4	12,036.8	12,213.7	11,255.4	9,928.2	8,342.0	7,032.2	5,754.3	4,666.4	3,701.7	2,874.2	2,165.3	5,571.6	94,982.2
Aspen	716.8	1,066.5	927.5	645.5	402.1	232.4	135.3	64.9	26.1	10.5	1.9	1.1	.1	4,230.7
Cottonwood	.9	20.9	27.3	72.7	51.9	53.2	45.5	31.3	37.3	24.5	18.2	15.5	10.3	409.5
Other hardwoods	39.9	27.0	21.2	8.5	7.9	1.5	1.2	1.1	.3	([1])	1.2	--	5.3	115.1
Total hardwoods	757.6	1,114.4	976.0	726.7	461.9	287.1	182.0	97.3	63.7	35.0	21.3	16.6	15.7	4,755.3
All species	10,198.0	13,151.2	13,189.7	11,982.1	10,390.1	8,629.1	7,214.2	5,851.6	4,730.1	3,736.7	2,895.5	2,181.9	5,587.3	99,737.5

[1]Less than 0.05 million cubic feet.

Table 64.--Net volume of sawtimber on commercial timberland in the Rocky Mountain States by species and diameter class, 1977

Species	Diameter class (inches)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, International 1/4-inch rule											
Douglas-fir	8,835.0	10,734.9	12,186.7	10,982.5	9,772.4	8,548.3	7,060.6	5,368.6	4,040.0	2,967.8	7,583.7	88,080.5
Ponderosa pine	3,459.2	5,901.1	7,205.9	7,944.2	7,753.2	7,270.7	6,468.1	5,641.7	5,020.2	4,246.3	11,366.5	72,277.1
Western white pine	792.1	1,180.0	1,012.3	1,064.4	1,089.9	1,082.6	970.3	862.6	582.3	478.4	1,364.0	10,478.9
Lodgepole pine	20,017.3	15,196.2	8,889.2	4,246.7	2,139.0	969.2	330.6	193.8	57.5	43.7	36.7	52,119.9
Whitebark and limber pines	1,088.1	1,345.9	1,017.6	755.9	491.5	353.2	236.3	141.8	102.4	68.0	121.6	5,722.3
Western larch	2,210.0	2,288.0	2,225.0	1,949.1	1,784.2	1,552.6	1,516.6	1,207.9	810.5	556.4	1,685.3	17,785.6
Grand fir	2,160.1	2,699.0	2,778.1	2,448.6	2,419.5	1,931.7	1,570.4	1,575.5	1,394.4	1,137.3	3,270.4	25,385.0
Subalpine fir	5,821.5	5,046.7	4,163.0	3,382.7	2,490.1	1,521.8	1,116.8	625.1	352.1	163.8	201.6	24,885.2
White fir	529.0	556.6	670.3	611.3	586.6	492.8	413.1	379.3	267.6	295.9	903.7	5,706.2
Engelmann spruce	6,946.2	8,150.6	8,351.9	8,340.2	7,353.3	6,009.0	5,035.0	3,860.6	2,956.2	1,816.6	3,549.2	62,368.8
Western and mountain hemlock	593.4	761.7	845.4	842.2	763.5	613.3	517.7	523.3	346.2	272.0	820.9	6,899.6
Western redcedar	898.5	1,020.5	1,053.6	866.6	843.6	870.6	686.9	586.0	558.2	577.5	2,452.6	10,414.6
Pinyon/juniper	3.7	2.7	2.8	2.9	7.2	2.6	2.1	.8	.2	.9	2.0	27.9
Other softwoods	75.8	52.8	50.1	29.7	16.4	4.7	11.8	3.4	2.8	3.8	16.6	267.9
Total softwoods	53,429.9	54,936.7	50,451.9	43,467.0	37,510.4	31,223.1	25,936.3	20,970.4	16,490.6	12,628.4	33,374.8	380,419.5
Aspen	XXXXX	3,265.5	2,113.9	1,254.8	740.7	366.5	148.0	57.6	10.2	6.7	.2	7,964.1
Cottonwood	XXXXX	351.4	256.2	266.4	230.5	160.8	189.4	126.9	94.4	81.6	70.3	1,827.9
Other hardwoods	XXXXX	48.8	41.1	7.1	5.5	5.4	1.6	.4	8.0	--	24.6	142.5
Total hardwoods	XXXXX	3,665,7	2,411.2	1,528.3	976.7	532.7	339.0	184.9	112.6	88.3	95.1	9,934.5
All species	53,429.9	58,602.4	52,863.1	44,995.3	38,487.1	31,755.8	26,275.3	21,155.3	16,603.2	12,716.7	33,469.9	390,354.0

Table 65.--Net volume of timber on commercial timberland in the Rocky Mountain States by class of timber, State, and species group, 1977

State	Growing stock trees			Rough trees			Rotten trees			Salvable dead trees			Total all timber		
	Soft-woods	Hard-woods	Total	Soft-woods	Hard-woods	Total	Soft-woods	Hard-woods	Total	Soft-woods	Hard-woods	Total	Soft-woods	Hard-woods	Total
	Million cubic feet														
Northern Rocky Mountain States:															
North Idaho	20,928.2	98.8	21,027.0	206.3	26.0	232.3	465.6	6.1	471.7	1,515.2	3.7	1,518.9	23,115.3	134.6	23,249.9
South Idaho	10,733.4	123.3	10,856.7	67.6	20.8	88.4	72.1	17.6	89.7	431.5	9.5	441.0	11,304.6	171.2	11,475.8
Western Montana	18,855.8	84.3	18,940.1	219.1	13.9	233.0	232.0	4.4	236.4	2,248.0	.9	2,248.9	21,554.9	103.5	21,658.4
Eastern Montana	8,834.7	202.3	9,037.0	251.7	10.2	261.9	96.9	11.2	108.1	861.6	9.5	871.1	10,044.9	233.2	10,278.1
Western South Dakota	1,626.7	16.3	1,643.0	14.2	14.9	29.1	2.4	3.9	6.3	27.2	([1])	27.2	1,670.5	35.1	1,705.6
Wyoming	6,962.9	231.8	7,194.7	230.5	28.5	259.0	123.2	39.9	163.1	530.2	23.6	553.8	7,846.8	323.8	8,170.6
Total, Northern Rocky Mountain States	67,941.7	756.8	68,698.5	989.4	114.3	1,103.7	992.2	83.1	1,075.3	5,613.7	47.2	5,660.9	75,537.0	1,001.4	76,538.4
Southern Rocky Mountain States:															
Arizona	4,762.6	219.6	4,982.2	135.3	70.7	206.0	18.3	55.9	74.2	122.9	4.5	127.4	5,039.1	350.7	5,389.8
Colorado	12,623.5	2,412.4	15,035.9	297.5	128.4	425.9	309.9	792.6	1,102.5	1,290.2	135.4	1,425.6	14,521.1	3,468.8	17,989.9
Nevada	249.3	13.0	262.3	5.2	2.0	7.2	3.7	8.0	11.7	9.1	1.5	10.6	267.3	24.5	291.8
New Mexico	5,796.0	599.2	6,395.2	237.1	96.0	333.1	37.4	108.3	145.7	259.5	44.1	303.6	6,330.0	847.6	7,177.6
Utah	3,609.1	754.3	4,363.4	49.7	12.6	62.3	35.3	135.0	170.3	132.6	35.6	168.2	3,826.7	937.5	4,764.2
Total, Southern Rocky Mountain States	27,040.5	3,998.5	31,039.0	724.8	309.7	1,034.5	404.6	1,099.8	1,504.4	1,814.3	221.1	2,035.4	29,984.2	5,629.1	35,613.3
Total, all Rocky Mountain States	94,982.2	4,755.3	99,737.5	1,714.2	424.0	2,138.2	1,396.8	1,182.9	2,579.7	7,428.0	268.3	7,696.3	105,521.2	6,630.5	112,151.7

[1]Less than 0.05 million cubic feet.

Table 66.--Net annual growth of growing stock and sawtimber on commercial timberland in the Northern Rocky Mountain States by State, softwoods and hardwoods, and owner group, 1976

State	National Forest	Other public	Forest industry	Other private	All owner groups	National Forest	Other public	Forest industry	Other private	All owner groups
	Thousand cubic feet growing stock					*Thousand board feet sawtimber*[1]				
North Idaho:										
Softwoods	274,872	64,465	67,421	123,614	530,372	1,324,940	218,207	281,772	427,021	2,251,940
Hardwoods	828	144	346	2,510	3,828	410	--	680	2,320	3,410
All species	275,700	64,609	67,767	126,124	534,200	1,325,350	218,207	282,452	429,341	2,255,350
South Idaho:										
Softwoods	106,291	18,008	5,928	8,964	139,191	538,817	76,994	25,841	38,165	679,817
Hardwoods	608	1,081	256	563	2,508	1,544	3,829	1,275	1,896	8,544
All species	106,899	19,089	6,184	9,527	141,699	540,361	80,823	27,116	40,061	688,361
Western Montana:										
Softwoods	246,156	27,369	28,299	51,432	353,256	661,143	113,346	129,050	192,604	1,096,143
Hardwoods	1,403	122	136	542	2,203	2,132	862	813	2,325	6,132
All species	247,559	27,491	28,435	51,974	355,459	663,275	114,208	129,863	194,929	1,102,275
Eastern Montana:										
Softwoods	73,790	13,208	184	32,808	119,990	189,262	32,218	529	80,253	302,262
Hardwoods	485	588	--	1,512	2,585	443	2,226	--	5,774	8,443
All species	74,275	13,796	184	34,320	122,575	189,705	34,444	529	86,027	310,705
Western South Dakota:										
Softwoods	30,463	1,870	608	5,763	38,704	134,378	6,971	2,701	23,568	167,618
Hardwoods	676	74	62	443	1,255	614	77	50	522	1,263
All species	31,139	1,944	670	6,206	39,959	134,992	7,048	2,751	24,090	168,881
Wyoming:										
Softwoods	66,766	5,815	800	9,485	82,866	293,492	20,496	2,891	30,613	347,492
Hardwoods	1,811	687	50	963	3,511	6,269	1,231	91	1,678	9,269
All species	68,577	6,502	850	10,448	86,377	299,761	21,727	2,982	32,291	356,761
Total, Northern Rocky Mountain States:										
Softwoods	798,338	130,735	103,240	232,066	1,264,379	3,142,032	468,232	442,784	792,224	4,845,272
Hardwoods	5,811	2,696	850	6,533	15,890	11,412	8,225	2,909	14,515	37,061
All species	804,149	133,431	104,090	238,599	1,280,269	3,153,444	476,457	445,693	806,739	4,882,333

[1]International 1/4-inch rule.

Table 67.--Net annual growth of growing stock and sawtimber on commercial timberland in the Southern Rocky Mountain States by State, softwoods and hardwoods, and owner group, 1976

State	National Forest	Other public	Forest industry	Other private	All owner groups	National Forest	Other public	Forest industry	Other private	All owner groups
	Thousand cubic feet growing stock					*Thousand board feet sawtimber*[1]				
Arizona:										
Softwoods	51,702	13,393	0	2,207	67,302	238,793	51,677	0	6,323	296,793
Hardwoods	3,327	853	0	747	4,927	14,997	1,225	0	1,775	17,997
All species	55,029	14,246	0	2,954	72,229	253,790	52,902	0	8,098	314,790
Colorado:										
Softwoods	115,141	7,955	212	28,433	151,741	660,944	31,602	618	104,780	797,944
Hardwoods	47,260	1,907	5	8,188	57,360	144,580	2,742	6	13,252	160,580
All species	162,401	9,862	217	36,621	209,101	805,524	34,344	624	118,032	958,524
Nevada:										
Softwoods	771	105	186	1,109	2,171	3,144	540	948	5,512	10,144
Hardwoods	248	--	--	--	248	331	--	--	--	331
All species	1,019	105	186	1,109	2,419	3,475	540	948	5,512	10,475
New Mexico:										
Softwoods	40,180	9,118	0	18,182	67,480	182,996	22,031	0	33,969	238,996
Hardwoods	5,131	-99	0	6,299	11,331	16,787	-789	0	11,789	27,787
All species	45,311	9,019	0	24,481	78,811	199,783	21,242	0	45,758	266,783
Utah:										
Softwoods	37,727	5,397	0	8,331	51,455	177,208	29,800	0	38,315	245,323
Hardwoods	4,397	2,360	0	7,102	13,859	10,721	7,795	0	23,479	41,995
All species	42,124	7,757	0	15,433	65,314	187,929	37,595	0	61,794	287,318
Total, Southern Rocky Mountain States:										
Softwoods	245,521	35,968	398	58,262	340,149	1,263,085	135,650	1,566	188,899	1,589,200
Hardwoods	60,363	5,021	5	22,336	87,725	187,416	10,973	6	50,295	248,690
All species	305,884	40,989	403	80,598	427,874	1,450,501	146,623	1,572	239,194	1,837,890
Total, all Rocky Mountain States:										
Softwoods	1,043,859	166,703	103,638	290,328	1,604,528	4,405,117	603,882	444,350	981,123	6,434,472
Hardwoods	66,174	7,717	855	28,869	103,615	198,828	19,198	2,915	64,810	285,751
All species	1,110,033	174,420	104,493	319,197	1,708,143	4,603,945	623,080	447,265	1,045,933	6,720,223

[1]International 1/4-inch rule.

Table 68.--Annual mortality of growing stock and sawtimber on commercial timberland in the Northern Rocky Mountain States by State, softwoods and hardwoods, and owner group, 1976

State	National Forest	Other public	Forest industry	Other private	All owner groups	National Forest	Other public	Forest industry	Other private	All owner groups
	- - - - - - Thousand cubic feet growing stock - - - - - -					- - - - - - - Thousand board feet sawtimber[1] - - - - - - -				
North Idaho:										
Softwoods	40,693	12,854	6,965	10,081	70,593	200,330	62,920	33,092	36,988	333,330
Hardwoods	232	--	200	--	432	0	--	1,000	--	1,000
All species	40,925	12,854	7,165	10,081	71,025	200,330	62,920	34,092	36,988	334,330
South Idaho:										
Softwoods	40,263	6,154	1,982	2,964	51,363	182,208	23,477	7,273	11,250	224,208
Hardwoods	377	326	115	159	977	634	1,087	384	529	2,634
All species	40,640	6,480	2,097	3,123	52,340	182,842	24,564	7,657	11,779	226,842
Western Montana:										
Softwoods	47,932	6,734	12,862	10,304	77,832	175,506	28,333	56,667	41,000	301,506
Hardwoods	49	14	9	177	249	--	--	--	--	--
All species	47,981	6,748	12,871	10,481	78,081	175,506	28,333	56,667	41,000	301,506
Eastern Montana:										
Softwoods	20,982	8,513	58	20,929	50,482	65,560	25,110	175	61,715	152,560
Hardwoods	--	433	--	1,067	1,500	--	1,733	--	4,267	6,000
All species	20,982	8,946	58	21,996	51,982	65,560	26,843	175	65,982	158,560
Western South Dakota:										
Softwoods	3,491	123	24	144	3,782	15,418	558	94	549	16,619
Hardwoods	--	1	([2])	8	9	--	1	1	24	26
All species	3,491	124	24	152	3,791	15,418	559	95	573	16,645
Wyoming:										
Softwoods	32,760	4,135	273	3,692	40,860	125,551	11,904	869	12,227	150,551
Hardwoods	195	415	30	555	1,195	57	800	56	1,144	2,057
All species	32,955	4,550	303	4,247	42,055	125,608	12,704	925	13,371	152,608
Total, Northern Rocky Mountain States:										
Softwoods	186,121	38,513	22,164	48,114	294,912	764,573	152,302	98,170	163,729	1,178,774
Hardwoods	853	1,189	354	1,966	4,362	691	3,621	1,441	5,964	11,717
All species	186,974	39,702	22,518	50,080	299,274	765,264	155,923	99,611	169,693	1,190,491

[1] International 1/4-inch rule.
[2] Less than 0.5 thousand cubic feet.

Table 69.--Annual mortality of growing stock and sawtimber on commercial timberland in the Southern Rocky Mountain States by State, softwoods and hardwoods, and owner group, 1976

State	National Forest	Other public	Forest industry	Other private	All owner groups	National Forest	Other public	Forest industry	Other private	All owner groups
	Thousand cubic feet growing stock					*Thousand board feet sawtimber*[1]				
Arizona:										
Softwoods	7,136	6,133	0	867	14,136	33,126	28,036	0	3,964	65,126
Hardwoods	597	350	0	50	997	2,139	876	0	124	3,139
All species	7,733	6,483	0	917	15,133	35,265	28,912	0	4,088	68,265
Colorado:										
Softwoods	49,873	5,443	171	22,386	77,873	212,298	17,631	470	75,899	306,298
Hardwoods	7,370	1,188	5	5,507	14,070	12,238	1,701	4	8,295	22,238
All species	57,243	6,631	176	27,893	91,943	224,536	19,332	474	84,194	328,536
Nevada:										
Softwoods	592	41	96	963	1,692	3,324	213	511	5,276	9,324
Hardwoods	35	--	--	--	35	95	--	--	--	95
All species	627	41	96	963	1,727	3,419	213	511	5,276	9,419
New Mexico:										
Softwoods	9,838	6,719	0	14,881	31,438	39,706	25,819	0	57,181	122,706
Hardwoods	1,789	902	0	1,998	4,689	4,021	2,489	0	5,511	12,021
All species	11,627	7,621	0	16,879	36,127	43,727	28,308	0	62,692	134,727
Utah:										
Softwoods	20,410	2,221	0	3,459	26,090	83,410	7,458	0	12,142	103,010
Hardwoods	7,216	828	0	1,262	9,306	17,977	1,563	0	1,160	20,700
All species	27,626	3,049	0	4,721	35,396	101,387	9,021	0	13,302	123,710
Total, Southern Rocky Mountain States:										
Softwoods	87,849	20,557	267	42,556	151,229	371,864	79,157	981	154,462	606,464
Hardwoods	17,007	3,268	5	8,817	29,097	36,470	6,629	4	15,090	58,193
All species	104,856	23,825	272	51,373	180,326	408,334	85,786	985	169,552	664,657
Total, all Rocky Mountain States:										
Softwoods	273,970	59,070	22,431	90,670	446,141	1,136,437	231,459	99,151	318,191	1,785,238
Hardwoods	17,860	4,457	359	10,783	33,459	37,161	10,250	1,445	21,054	69,910
All species	291,830	63,527	22,790	101,453	479,600	1,173,598	241,709	100,596	339,245	1,855,148

[1]International 1/4-inch rule.

Table 70.--Trends in timber removals from growing stock in the Northern Rocky Mountain States by ownership, and softwoods and hardwoods

Ownership and species group	1952	1962	1970	1976
		Thousand cubic feet		
National Forest:				
Softwoods	147,444	303,331	374,949	340,529
Hardwoods	151	308	22	59
Total	147,595	303,639	374,971	340,588
Other public:				
Softwoods	61,888	54,297	59,167	61,558
Hardwoods	64	56	6	8
Total	61,952	54,353	59,173	61,566
Forest industry:				
Softwoods	98,521	128,430	180,317	176,514
Hardwoods	99	130	12	14
Total	98,620	128,560	180,329	176,528
Other private:				
Softwoods	100,334	81,121	86,586	90,706
Hardwoods	98	81	11	12
Total	100,432	81,202	86,597	90,718
All ownerships:				
Softwoods	408,187	567,179	701,019	669,307
Hardwoods	412	575	51	93
Total	408,599	567,754	701,070	669,400

Table 71.--Trends in timber removals from growing stock in the Southern Rocky Mountain States by ownership, and softwoods and hardwoods

Ownership and species group	1952	1962	1970	1976
	- - - - - - - - - - - *Thousand cubic feet* - - - - - - - - - - -			
National Forest:				
Softwoods	81,739	108,420	149,079	122,670
Hardwoods	1,498	1,981	3,024	2,377
Total	83,237	110,401	152,103	125,047
Other public:				
Softwoods	17,204	31,276	26,435	31,179
Hardwoods	228	372	130	31
Total	17,432	31,648	26,565	31,210
Forest industry:				
Softwoods	4]6	1,467	5,475	307
Hardwoods	11	17	57	1
Total	427	1,484	5,532	308
Other private:				
Softwoods	26,368	29,451	6,925	18,828
Hardwoods	448	545	265	883
Total	26,816	29,996	7,190	19,711
All ownerships:				
Softwoods	125,727	70,614	187,914	172,984
Hardwoods	2,185	2,915	3,476	3,292
Total	127,912	173,529	191,390	176,276

Table 72.--Trends in timber removals from growing stock in the Rocky Mountain States by ownership, and softwoods and hardwoods

Ownership and species group	1952	1962	1970	1976
	- - - - - - - - - - *Thousand cubic feet* - - - - - - - - - -			
National Forest:				
Softwoods	229,183	411,751	524,028	463,199
Hardwoods	1,649	2,289	3,046	2,436
Total	230,832	414,040	527,074	465,635
Other public:				
Softwoods	79,092	85,573	85,602	92,737
Hardwoods	292	428	136	39
Total	79,384	86,001	85,738	92,776
Forest industry:				
Softwoods	98,937	129,897	185,792	176,821
Hardwoods	110	147	69	15
Total	99,047	130,044	185,861	176,836
Other private:				
Softwoods	126,702	110,572	93,511	109,534
Hardwoods	546	626	276	895
Total	127,248	111,198	93,787	110,429
All ownerships:				
Softwoods	533,914	737,793	888,933	842,291
Hardwoods	2,597	3,490	3,527	3,385
Total	536,511	741,283	892,460	845,676

Table 73.--Trends in timber removals from sawtimber in the Northern Rocky Mountain States by ownership, and softwoods and hardwoods

Ownership and species group	1952	1962	1970	1976
		Thousand board feet[1]		
National Forest:				
Softwoods	853,760	1,748,232	2,049,096	1,959,206
Hardwoods	865	1,776	127	355
Total	854,625	1,750,008	2,049,223	1,959,561
Other public:				
Softwoods	381,084	333,259	341,568	352,023
Hardwoods	399	353	33	40
Total	381,483	333,612	341,601	352,063
Forest industry:				
Softwoods	618,013	769,314	1,030,648	1,013,754
Hardwoods	643	800	79	85
Total	618,656	770,114	1,030,727	1,013,839
Other private:				
Softwoods	577,827	473,008	496,561	521,014
Hardwoods	582	481	65	70
Total	578,409	473,489	496,626	521,084
All ownerships:				
Softwoods	2,430,684	3,323,813	3,917,873	3,845,997
Hardwoods	2,489	3,410	304	550
Total	2,433,173	3,327,223	3,918,177	3,846,547

[1]International 1/4-inch rule.

Table 74.--Trends in timber removals from sawtimber in the Southern Rocky Mountain States by ownership, and softwoods and hardwoods

Ownership and species group	1952	1962	1970	1976
	Thousand board feet[1]			
National Forest:				
Softwoods	525,480	678,498	835,181	706,138
Hardwoods	9,476	12,178	10,478	12,614
Total	534,956	690,676	845,659	718,752
Other public:				
Softwoods	80,062	147,758	156,484	171,665
Hardwoods	1,164	1,670	621	170
Total	81,226	149,428	157,105	171,835
Forest industry:				
Softwoods	2,349	8,376	32,300	1,710
Hardwoods	65	92	333	2
Total	2,414	8,468	32,633	1,712
Other private:				
Softwoods	145,564	128,598	38,729	110,228
Hardwoods	2,435	2,425	663	3,046
Total	147,999	131,023	39,392	113,274
All ownerships:				
Softwoods	753,455	963,230	1,062,694	989,741
Hardwoods	13,140	16,365	12,095	15,832
Total	766,595	979,595	1,074,789	1,005,573

[1]International 1/4-inch rule.

Table 75.--Trends in timber removals from sawtimber in the Rocky Mountain States by ownership, and softwoods and hardwoods

Ownership and species group	1952	1962	1970	1976
	- - - - - - - - - - *Thousand board feet*[1] - - - - - - - - - -			
National Forest:				
Softwoods	1,379,240	2,426,730	2,884,277	2,665,344
Hardwoods	10,341	13,954	10,605	12,969
Total	1,389,581	2,440,684	2,894,882	2,678,313
Other public:				
Softwoods	61,146	481,017	498,052	523,688
Hardwoods	1,563	2,023	654	210
Total	462,709	483,040	498,706	523,898
Forest industry:				
Softwoods	620,362	777,690	1,062,948	1,015,464
Hardwoods	708	892	412	87
Total	621,070	778,582	1,063,360	1,015,551
Other private:				
Softwoods	723,391	601,606	535,290	631,242
Hardwoods	3,017	2,906	728	3,116
Total	726,408	604,512	536,018	634,358
All ownerships:				
Softwoods	3,184,139	4,287,043	4,980,567	4,835,738
Hardwoods	15,629	19,775	12,399	16,382
Total	3,199,768	4,306,818	4,992,966	4,852,120

[1]International 1/4-inch rule.

Table 76.--Removals from growing stock on commercial timberland in the Rocky Mountain States by roundwood products, logging residues, and other removals, 1976

State	Total removals	Products									
		All products	Saw logs	Veneer logs	Pulpwood	Commercial poles	Mine timbers	Miscellaneous industrial wood	Posts, fuelwood, miscellaneous farm timbers	Logging residues	Other removals
	Thousand cubic feet										
Northern Rocky Mountain States:											
Idaho	394,804	349,504	291,603	38,133	12,751	3,384	2	3,266	365	41,282	4,018
Montana	234,802	199,268	171,564	23,205	1,188	590	1,333	470	918	31,852	3,682
Western South Dakota	20,410	19,369	12,985	--	4,100	559	--	--	1,725	801	240
Wyoming	19,384	17,289	17,130	--	--	6	54	55	44	1,324	771
Total, Northern Rocky Mountain States	669,400	585,430	493,282	61,338	18,039	4,539	1,389	3,791	3,052	75,259	8,711
Southern Rocky Mountain States:											
Arizona	83,352	74,872	64,938	--	5,407	162	143	23	4,199	7,946	554
Colorado	38,670	32,607	25,945	2,633	--	445	1,587	1,760	237	3,224	2,859
Nevada	75	67	67	--	--	--	--	--	--	5	3
New Mexico	41,122	36,333	36,001	--	--	183	60	87	2	4,451	338
Utah	13,057	11,565	9,762	--	554	592	245	57	355	1,188	304
Total, Southern Rocky Mountain States	176,276	155,444	136,713	2,633	5,961	1,382	2,035	1,927	4,793	16,814	4,018
Total, all Rocky Mountain States	845,676	740,874	629,995	63,971	24,000	5,921	3,424	5,718	7,845	92,073	12,729

Table 77.--Removals from sawtimber on commercial timberland in the Rocky Mountain States by roundwood products, logging residues, and other removals, 1976

State	Total removals	Products								Logging residues	Other removals
		All products	Saw logs	Veneer logs	Pulpwood	Commercial poles	Mine timbers	Miscellaneous industrial wood	Posts, fuelwood, miscellaneous farm timbers		
	Thousand board feet, International 1/4-inch rule										
Northern Rocky Mountain States:											
Idaho	2,315,747	2,161,094	1,818,866	237,852	70,379	15,733	--	16,774	1,490	129,634	25,019
Montana	1,308,644	1,188,430	1,031,779	139,555	5,798	2,726	3,603	2,101	2,868	97,981	22,233
Western South Dakota	117,173	114,724	82,093	--	23,308	2,608	--	--	6,715	1,030	1,419
Wyoming	104,983	98,147	98,045	--	--	25	3	43	31	2,072	4,764
Total, Northern Rocky Mountain States	3,846,547	3,562,395	3,030,783	377,407	99,485	21,092	3,606	18,918	11,104	230,717	53,435
Southern Rocky Mountain States:											
Arizona	462,158	457,278	411,820	--	14,715	758	397	73	9,515	21,762	3,118
Colorado	219,904	194,265	161,981	16,442	--	2,068	4,044	8,808	922	8,629	17,010
Nevada	421	391	391	--	--	--	--	--	--	15	15
New Mexico	243,878	227,220	226,143	--	--	857	42	169	9	14,545	2,113
Utah	79,212	69,955	62,572	--	1,514	2,804	677	329	2,059	7,374	1,883
Total, Southern Rocky Mountain States	1,005,573	929,109	862,907	16,442	16,229	6,487	5,160	9,379	12,505	52,325	24,139
Total, all Rocky Mountain States	4,852,120	4,491,504	3,893,690	393,849	115,714	27,579	8,766	28,297	23,609	283,042	77,574

Green, Alan W.; Van Hooser, Dwane D. Forest resources of the Rocky Mountain States. Resour. Bull. INT-33. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1983. 127 p.

Presents highlights of the forest resources of the Rocky Mountain States as of 1977. Describes the forest resources, their extent and location, and some considerations for their future use and management. Includes statistical tables: area by land classes, ownership, growing stock volumes, net annual growth, mortality, roundwood products output, and logging residues.

KEYWORDS: commercial timberland, forest inventory, timber volume, timber growth, timber mortality, timber removals

U.S. GOVERNMENT PRINTING OFFICE: 1983—676-032/1026 REGION NO. 8

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Forest Service

**Intermountain
Forest and Range
Experiment Station
Ogden, UT 84401**

Resource Bulletin
INT-34

March 1984

Forest Statistics for Private Land in Northern Idaho

Dwane D . Van Hooser

THE AUTHOR

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Finally, the author thanks the many owners in northern Idaho for allowing access to their lands for data collection purposes.

RESEARCH SUMMARY

The privately owned forest land in the 10 northern Idaho counties amounts to 2,488,972 acres. These acres contain 4.5 billion cubic feet of growing stock and more than 19 billion board feet of sawtimber. This report presents information on total land area, timberland area, timber inventory, annual growth, mortality, and removals.

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Forest Statistics for Private Land in Northern Idaho

Dwane D. Van Hooser

INTRODUCTION

The most recent inventory of northern Idaho (fig. 1) began May 18, 1980, amidst the dust and rubble following the eruption of Mount St. Helens, and was completed April 15, 1981. This activity marked not only the beginning of the third inventory cycle in this area, but also the beginning of a new era for Forest Survey. For the first time, all forest lands were inventoried, regardless of their inherent capability to produce wood. In addition, data on use and condition were taken. This report summarizes the basic forest statistics for the private lands in the northern 10 counties of the State. Information for the working circle, each individual county, and the two major marketing zones (fig. 2) is presented. A comprehensive report covering all lands and all owners will be available in the near future.

The primary objective of Forest Survey—a continuing, nationwide undertaking of the Forest Service, U.S. Department of Agriculture—is to provide an assessment of the renewable resource situation for forest and rangelands of the Nation. Fundamental to the accomplishment of this objective are the periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

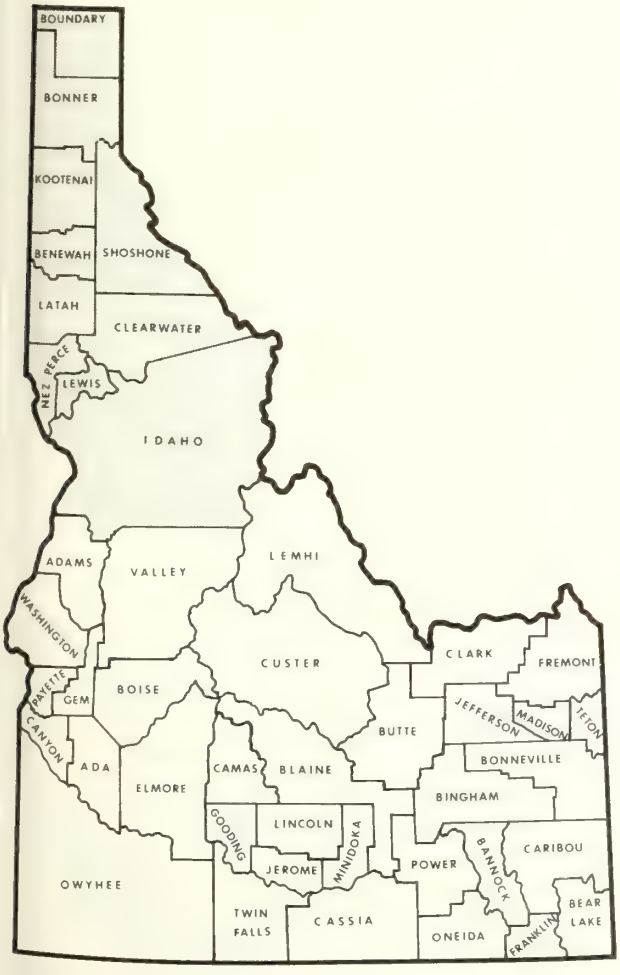


Figure 1.—Northern Idaho counties.

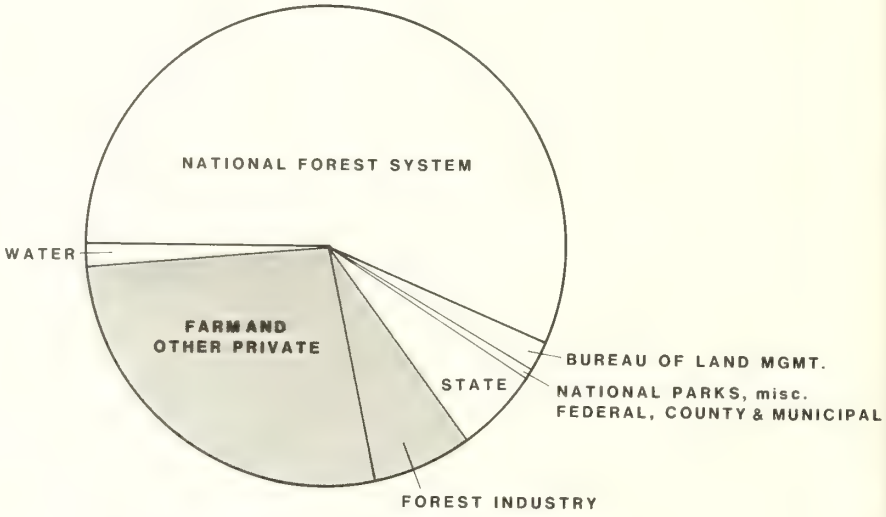
Figure 2.—Marketing zones in Idaho (source: Idaho Forest Products Marketing Bulletin).

The Intermountain Forest and Range Experiment Station with headquarters in Ogden, Utah, administers the forest resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, Wyoming, western South Dakota, western Texas, and Oklahoma's Panhandle. These inventories provide information on the extent and condition of State and privately owned forest lands, volume of timber, and rates of timber growth, removals, and mortality. These data, when combined with similar information on Federal lands, provide a basis for forming forest policies and programs and for the orderly development and use of the resources.

HIGHLIGHTS

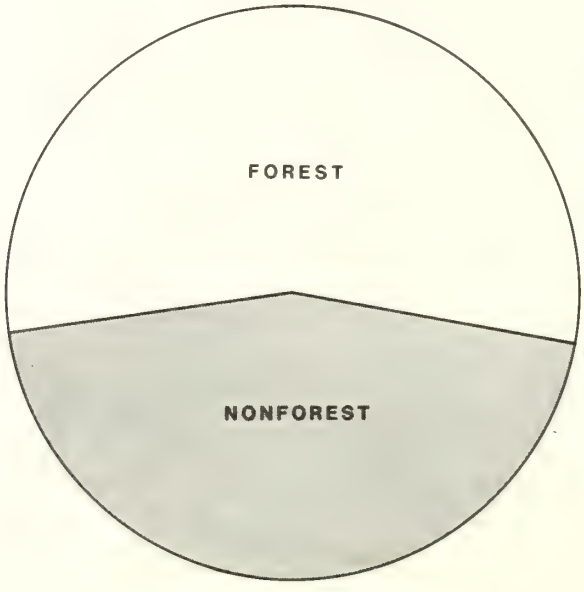
Area

Private holdings in northern Idaho amount to 4.5 million acres—more than one-third of the total area.

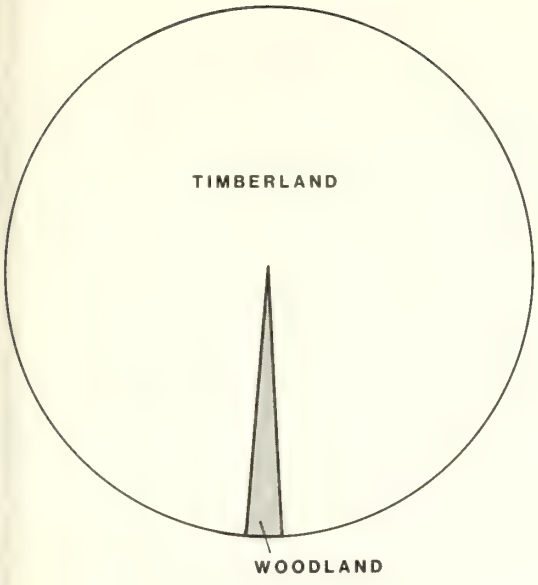


Total land area in northern Idaho by ownership class.

Of this 4.5-million-acre land base, some 55 percent—2.5 million acres—is forested.

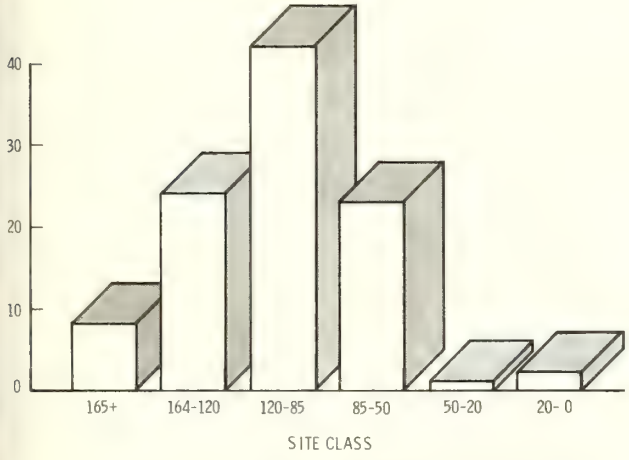


Total private land area by type of land.



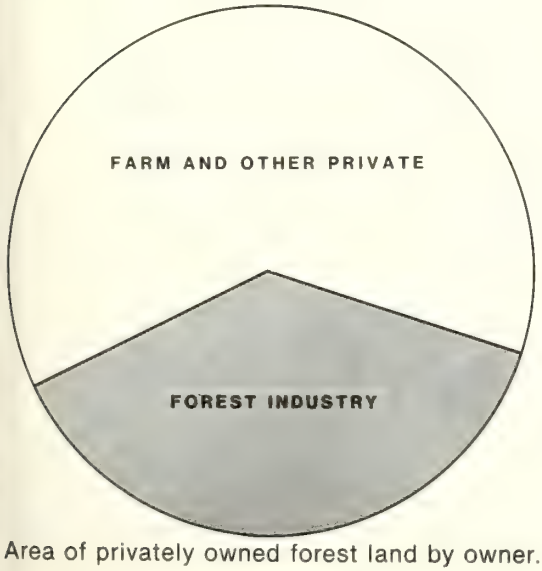
Area of privately owned forest land by type of land.

All but 41,000 acres are dominated by tree species that are traditionally used for conversion into industrial roundwood products.



Area of privately owned forest land by site class.

Northern Idaho contains some of the most productive sites in the Rocky Mountains. More than three-fourths of the forested acres have the potential to produce 85 or more cubic feet per acre. Fully one-third is capable of producing 120 or more cubic feet per acre.



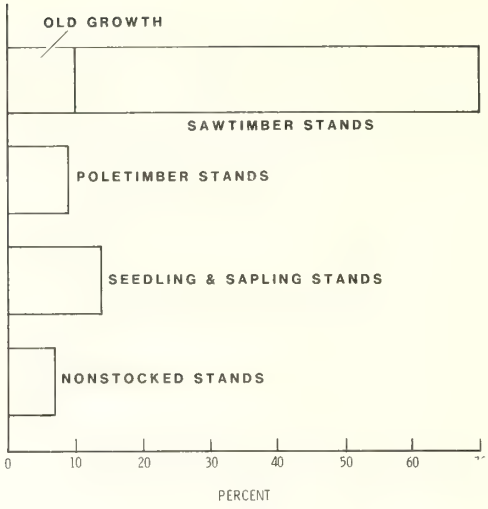
Area of privately owned forest land by owner.

Nonindustrial private owners control nearly 1.6 million acres—two-thirds of the privately owned forest land in northern Idaho.

Fully stocked stands occupy nearly one-fifth of the forest area.

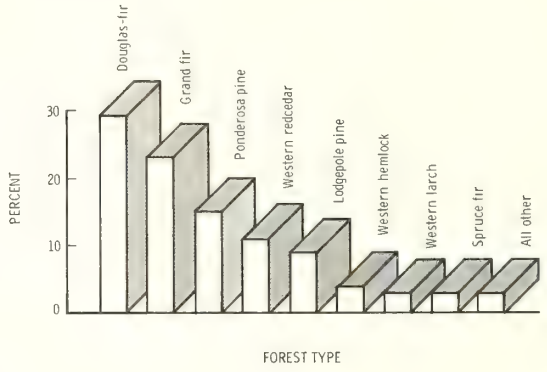
Only about 10 percent of the private forest land is in old-growth stands.

Nearly 70 percent of the forest is in sawtimber stands.



Distribution of privately owned timberland by stand size.

Douglas-fir (*Pseudotsuga menziesii* [Mirb.] Franco) and grand fir (*Abies grandis* [Dougl. ex D. Don] Lindl.) forest types predominate on more than half the forest area. The pines—ponderosa (*Pinus ponderosa* Dougl. ex Laws. var. *ponderosa*), lodgepole (*Pinus contorta* Dougl. ex Loud.) and western white (*Pinus monticola* Dougl. ex D. Don)—together occupy another one-quarter of the forest area.



Area of privately owned timberland by forest type.

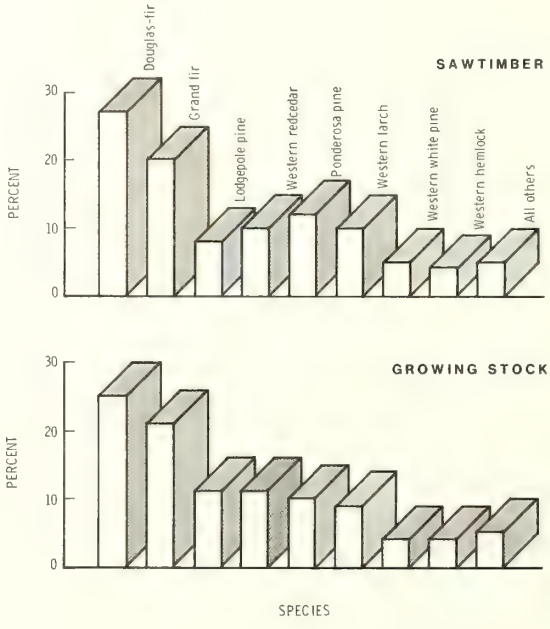
Volume

Growing stock volume amounts to 4.6 billion cubic feet and sawtimber totals 19.2 billion board feet. Rough, rotten, and salvable dead trees account for an additional 349 million cubic feet.

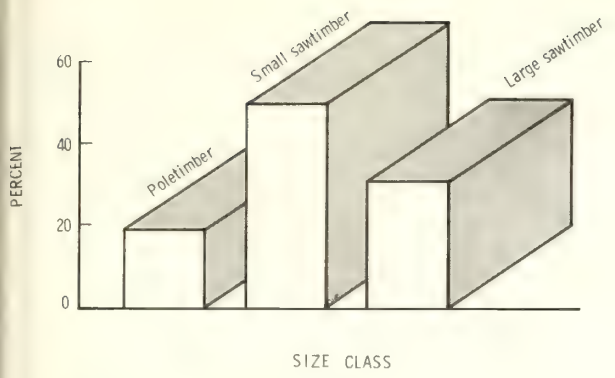
The most dominant species, Douglas-fir, constitutes 1.2 billion cubic feet—more than one-fourth of the total growing inventory.

One-fifth of the growing stock and sawtimber inventory is contained in another single species—grand fir.

Sawtimber-size trees account for 81 percent of the total growing stock inventory.



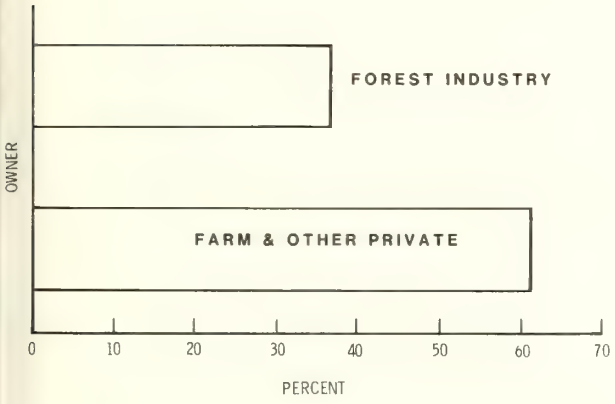
Distribution of sawtimber and growing stock volume on privately owned timberland by species.



Growing stock volume on privately owned timberland by tree size class.

Trees over 17 inches diameter at breast height (d.b.h.) account for 40 percent of the total sawtimber inventory.

More than three-fifths of the growing stock volume is in nonindustrial private holdings.

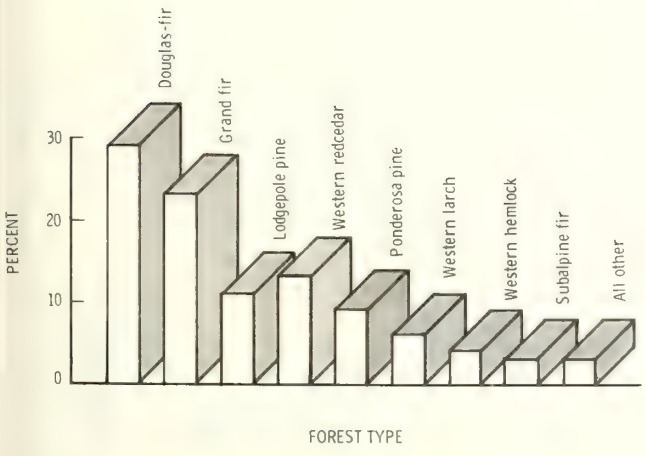


Distribution of growing stock volume on privately owned timberland by owner.

The average nonindustrial private acre contains 1,785 cubic feet of growing stock including 7,320 board feet of sawtimber.

The average acre in forest industry ownership supports more than 2,000 cubic feet of growing stock including almost 9,000 board feet of sawtimber.

The sawtimber stands contain 88 percent of the growing stock volume and 94 percent of the board foot volume.

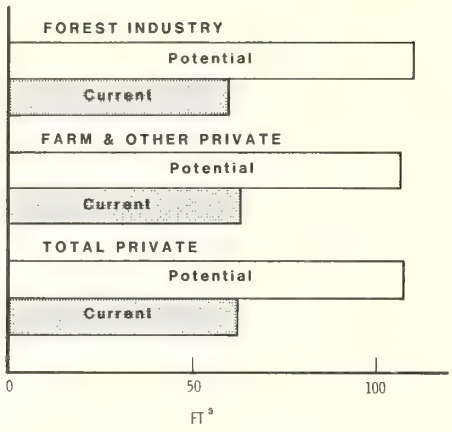


Volume of growing stock on privately owned timberland by forest type.

Stands in which either Douglas-fir or grand fir dominate account for more than half of the total growing stock and sawtimber inventory.

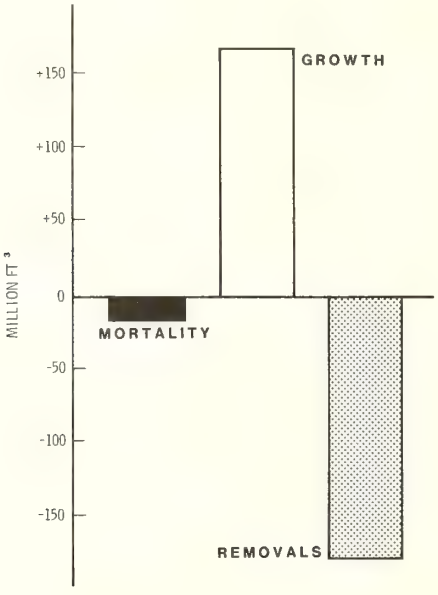
Components of Change

Currently, the forest is producing just over half of its potential of 108 cubic feet per acre. Net annual growth amounted to 150 million cubic feet of growing stock and 558 million board feet of sawtimber.



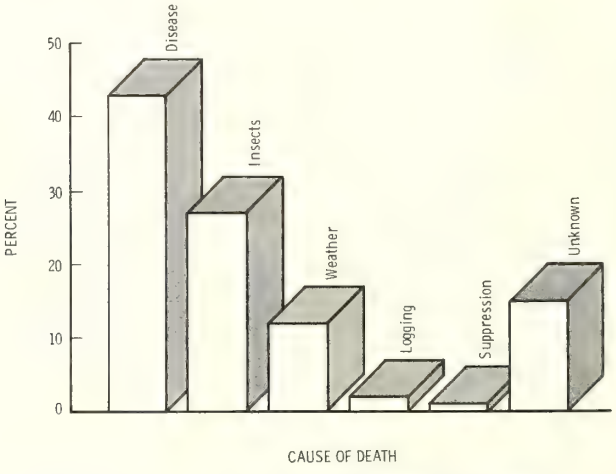
Current versus potential growth per acre on privately owned timberland by owner.

Annual mortality of 19 million cubic feet offset 11 percent of total growth on growing stock. The annual mortality reduced sawtimber growth by 69 million board feet—11 percent.

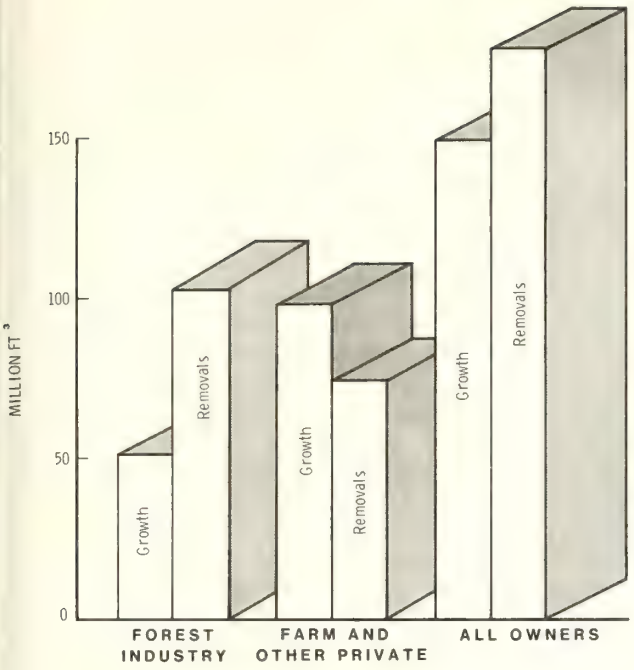


Components of change on privately owned timberland.

The major cause of mortality was disease, followed by insects and weather. Together these accounted for more than 80 percent of the total mortality volume in both growing stock and sawtimber.



Growing stock mortality on privately owned forest land by cause.

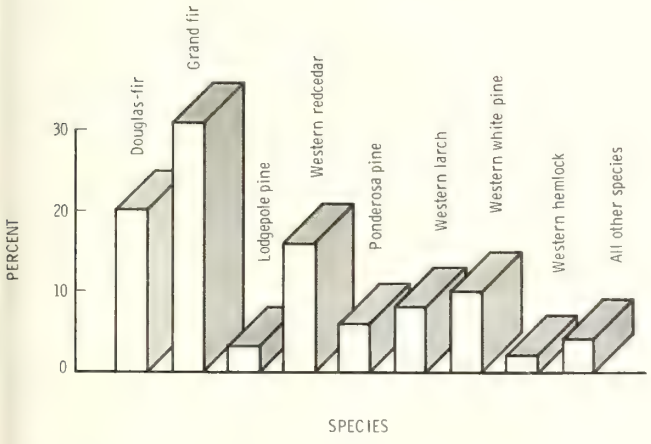


Growing stock growth versus removals on privately owned timberland by owner.

Removals amounted to 178 million cubic feet of growing stock and 1,013 million board feet of sawtimber. This is 4 percent of the growing stock inventory and 5 percent of the sawtimber inventory.

Removals exceed growing stock growth by nearly 20 percent and sawtimber growth by more than 80 percent. Thus, the growing stock inventory experienced a net decrease of 29 million cubic feet and 455 million board feet.

Nearly 90 percent of removals were converted into industrial roundwood products. The major product, accounting for 74 percent, was sawlogs.



Distribution of removals from growing stock on privately owned timberland by species.

One species—grand fir—accounts for nearly one-third of the removals from private lands.

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics primarily at the State and working circle levels.

1. Initial area estimates were based on the classification of 17,717 sample points systematically placed on the latest aerial photographs available. The sample points were summarized and grouped into strata for subsequent field sampling. The photo points, adjusted to meet known land areas, were used to compute area expansion factors for the sampling strata means.

2. Land classification and estimates for timber characteristics and volume were based on observations and measurements recorded at 699 ground sample locations, of which 426 were forested. Sample trees were selected using a 5-point cluster, which includes fixed radius plots (1/300 acre) for trees less than 5 inches d.b.h., and variable radius plots (40 basal area factor) for trees 5 inches d.b.h. or larger.

3. All photo and field data were punched onto cards and stored for computer editing, computation, and tabulation. Final estimates were based on statistical summaries of the data.

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on small sample sizes, which may result in high sampling errors. The standard error percentages shown in tables 1 and 2 were calculated at the 67 percent confidence level.

TERMINOLOGY

The following section contains definitions that are relevant to the timber resource data presented in this resource bulletin.

Land

Area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains; streams, sloughs, estuaries, and canals less than 120 feet in width; and lakes, reservoirs, and ponds less than 1 acre in size.

Water

Streams, sloughs, estuaries, and canals more than 120 feet in width; and lakes, reservoirs, and ponds more than 1 acre in size.

Land Use Classes

Forest land.—Land at least 10 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use.

Timberland.—Forest land at least 10 percent stocked with timber species that are producing or capable of producing crops of industrial wood and not reserved. Currently areas that may be inaccessible or inoperable are included.

Reserved forest land.—Forest land withdrawn from timber utilization through statute or administrative designation.

Woodland.—Forest land less than 10 percent stocked with timber species and not reserved.

Nonforest land.—Land that has never supported forests and lands formerly forested where use for timber management is precluded by development for other uses.

Public Ownership Classes

National Forest lands.—Federal lands legally designated as National Forest or purchase units and other lands under the administration of the Forest Service, including experimental areas and Bankhead-Jones Title III lands.

Bureau of Land Management lands.—Federal lands administered by the Bureau of Land Management.

Miscellaneous Federal lands.—Federal lands other than (1) National Forest lands and (2) lands administered by the Bureau of Land Management.

State lands.—Lands owned by States or lands leased to these governmental units for 50 years or more.

County and municipal lands.—Lands owned by counties and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

Private Ownership Classes

Forest industry lands.—Lands owned by companies or by individuals operating wood-processing plants.

Farmer-owned lands.—Lands owned by farm operators. These exclude lands leased by farm operators from such nonfarm owners as railroad companies and States.

Other private lands.—Privately owned lands other than forest industry and farmer-owned lands.

Forest Type and Tree Species

Forest types.—A classification of forest land based upon the species forming a plurality of live-tree stocking.

Forest trees.—Woody plants having a well-developed stem or stems, usually more than 12 feet in height at maturity, with a more or less well defined crown.

Timber species.—Forest tree species presently or prospectively suitable for industrial wood products.

Woodland species.—Forest tree species not usually converted into conventional industrial wood products.

Softwoods.—Monocotyledonous trees, usually evergreen having needles or scalelike leaves.

Hardwoods.—Dicotyledonous trees, usually broadleaved and deciduous.

Area Condition Classes

Stocking.—Stocking is an expression of the extent to which growing space is effectively utilized by present or potential growing stock trees of commercial species. "Percent of stocking" is synonymous with "percentage of growing space occupied" and means the ratio of actual stocking to full stocking for comparable sites and stands. Basal area is used as a basis for measuring stocking.

"Stocking percentages" express current area occupancy in relation to specified standards for full stocking based on number, size, and spacing of trees considered necessary to fully utilize the forest land.

Full utilization of the site is assumed to occur over a range of basal area. As an interim guide, 60 percent of normal yield table values has been used to establish the lower limit of this range, which represents full-site occupancy, and equals 100 percent stocking. The upper limit of full stocking has been set at 132 percent.

Class 10.—Areas fully stocked (100 to 132 percent) with desirable trees and not overstocked (133 percent or more).

Class 20.—Areas fully stocked with desirable trees, but overstocked with all live trees.

Class 30.—Areas medium to fully stocked (60 to 99 percent) with desirable trees and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Class 40.—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and/or conditions that ordinarily prevent occupancy by desirable trees.

Class 50.—Areas poorly stocked (16.7 to 59 percent) with desirable trees, but fully stocked with growing stock trees.

Class 60.—Areas poorly stocked with desirable trees, but with medium to full stocking of growing stock trees.

Class 70.—Areas nonstocked (less than 16.7 percent) or poorly stocked with desirable trees, and poorly stocked with growing stock trees.

Class 80.—Low-risk old-growth stands.

Class 90.—High-risk old-growth stands.

Nonstocked.—Areas less than 16.7 percent stocked with growing stock trees.

Productivity

Productivity class.—A classification of forest land in terms of potential growth in cubic feet of fully stocked natural stands.

Stand-Size Classes

Sawtimber stands.—Stands at least 16.7 percent stocked with growing stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber stands.—Stands at least 16.7 percent stocked with growing stock trees in which half or more of this stocking is in poletimber and/or sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

Sapling-seedling stands.—Stands at least 16.7 percent stocked with growing stock trees in which more than half of the stocking is saplings and/or seedlings.

Nonstocked land.—Commercial timberland less than 16.7 percent stocked with growing stock trees.

Class of Timber

Growing stock trees.—Live trees of timber species qualifying as desirable or acceptable trees. (Excludes rough, rotten, and dead trees of timber species and woodland species.)

Desirable trees.—Growing stock trees (1) having no serious defect in quality to limit present or prospective use for timber products; (2) of relatively high vigor; and (3) containing no pathogens that may result in death or serious deterioration before rotation age.

Acceptable trees.—Growing stock trees meeting specified standards of size and quality, but not qualifying as desirable trees.

Rough trees.—Live trees that are timber species that do not contain at least one 12-foot saw log or two noncontiguous saw logs, each 8 feet or longer, now or prospectively, and/or do not meet Rocky Mountain regional specifications for freedom from defect primarily because of roughness or poor form.

Rotten trees.—Live trees that are timber species that do not contain at least one 12-foot saw log or two noncontiguous saw logs, each 8 feet or longer, now or prospectively, and/or do not meet Rocky Mountain regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume (cubic-foot basis) in a tree is rotten.

Salvable dead trees.—Standing or down dead trees that are considered merchantable by Rocky Mountain regional standards.

Saw-log portion.—That part of the bole of sawtimber trees between the stump and the saw-log top. A 1-foot stump is used.

Upper-stem portion.—That part of the bole of sawtimber trees above the saw-log top to a minimum top diameter of 4 inches outside bark or to the point where the central stem breaks into limbs, whichever occurs first.

Tree-Size Classes

Seedlings.—Live trees less than 1 inch d.b.h.

Saplings.—Trees 1 to 4.9 inches d.b.h.

Poletimber trees.—Trees that are timber species at least 5 inches d.b.h., but smaller than sawtimber size.

Sawtimber trees.—Trees that are timber species and exceed poletimber size. In the Intermountain States, the minimum d.b.h. for softwood sawtimber is 9 inches and for hardwoods 11 inches.

Volume

Cull volume.—Portions of a tree's volume that are not usable for industrial wood products because of rot, form, or other defect.

Net volume.—Gross volume less deductions for cull.

Growing stock volume.—Net volume in cubic feet of live sawtimber trees and live poletimber trees from stump to a minimum 4-inch top (of central stem) outside bark. Net volume equals gross volume less deduction for rot and missing bole sections.

Sawtimber volume.—Net volume in board feet of sawtimber trees of commercial species. Net volume equals gross volume less deduction for rot, sweep, crook, and other defects that affect use for lumber.

Components of Change

Net annual growth.—The increase in net growing stock or sawtimber volume of a specified size class for a specific year. Components of net annual growth include the increment in net volume of trees at the beginning of the specific year surviving to its end, plus the net volume of trees reaching the size class during the year, minus the net volume of trees that died during the year, minus the net volume of trees that became rough or rotten trees during the year.

Mortality.—Number or sound-wood volume of growing stock trees dying from natural causes during a specified period, usually annually.

Removals.—The net volume of growing stock or sawtimber trees removed from the inventory by harvesting, including the unused portions of growing stock or sawtimber trees cut or killed by logging, and cultural operations such as timber stand improvement, land clearings, and changes in land use.

FOREST SURVEY TABLES

Table 1.--Area of private forest land in northern Idaho with percent standard error, 1981

Item	Softwoods		Hardwoods		All types	
	Acres	Percent standard error	Acres	Percent standard error	Acres	Percent standard error
Timberland	2,434,148	±1.4	13,852	±71.8	2,448,000	±1.3
Productive reserved[1]	--		--		--	
Other forest land:						
Unproductive reserved[1]	--		--		--	
Unproductive nonreserved	--	--	40,972	±35.8	40,972	±35.8

[1]Reserved land ares are estimated from aerial photos without field verification; therefore, standard errors are not calculated.

Table 2.--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on private timberland in northern Idaho with percent standard error

Item	Softwoods		Hardwoods		All species	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume, 1981:						
Growing stock (M cubic feet)	4,542,847	±4.4	46,554	±34.7	4,589,401	±4.4
Sawtimber[1] (M board feet)	18,974,239	±5.0	186,978	±40.8	19,161,217	±5.0
Net annual growth, 1980:						
Growing stock (M cubic feet)	147,849	±5.9	1,778	±58.9	149,627	±5.8
Sawtimber[1] (M board feet)	555,568	±5.9	2,088	±100.0	557,656	±5.9
Annual mortality, 1980:						
Growing stock (M cubic feet)	18,147	±17.0	545	±100.0	18,692	±16.7
Sawtimber[1] (M board feet)	66,035	±19.1	2,918	±100.0	68,953	±18.7

[1]International ¼-inch rule.

Table 3.--Total land and water area in northern Idaho by ownership class, 1981

Ownership class	Area
	- - - Acres - - -
Land:	
National Forest	7,771,096
Bureau of Land Management	271,110
National Park Service	2,109
Miscellaneous federal lands	40,844
State	793,275
County and municipal	34,958
Private:	
Forest industry[1]	917,712
Nonindustrial private:	
Farmer-rancher	2,608,305
Other	1,014,671
Total	3,622,976
Total private	4,540,688
Total land area	13,454,080
Census water	201,288
Total land and water[2]	13,655,368

[1]Forest industry is a component of private ownership, but because of its importance to the northern Idaho timber supply situation, area and resource statistics for forest industry are shown separately in this and other tables dealing with owner groups in this report.

[2]U.S. Bureau of the Census, land and water area of the United States, 1980.

Table 4.--Total land area in private ownership in northern Idaho by major land class and ownership class, 1981

Land class	Ownership class		
	Forest industry	Nonindustrial private	Total
	- - - - - - - - - - - - - - Acres - - - - - - - - - - - - - -		
Timberland	863,092	1,584,908	2,448,000
Nonreserved woodland	8,117	32,855	40,972
Total	871,209	1,617,763	2,488,972
Nonforest land	46,503	2,005,213	2,051,716
Total land area	917,712	3,622,976	4,540,688

Table 5.--Area of privately owned timberland in northern Idaho by forest type, stand-size class, and productivity class, 1981

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
	Acres					
Douglas-fir:						
Sawtimber	66,461	180,688	196,512	65,731	--	509,392
Poletimber	13,733	4,842	24,083	13,852	--	56,510
Sapling and seedling	4,843	16,947	40,955	30,863	--	93,608
Nonstocked	--	3,244	7,016	34,834	4,843	49,937
Total	85,037	205,721	268,566	145,280	4,843	709,447
Western hemlock:						
Sawtimber	--	19,711	27,731	23,278	--	70,720
Poletimber	--	--	14,311	--	--	14,311
Sapling and seedling	--	--	6,404	--	--	6,404
Nonstocked	--	--	--	--	--	--
Total	--	19,711	48,446	23,278	--	91,435
Ponderosa pine:						
Sawtimber	12,749	69,170	99,861	59,686	--	241,466
Poletimber	4,729	--	--	13,314	--	18,043
Sapling and seedling	--	5,946	12,419	12,048	--	30,413
Nonstocked	--	--	39,297	32,484	17,311	89,092
Total	17,478	75,116	151,577	117,532	17,311	379,014
Western white pine:						
Sawtimber	13,305	--	--	--	--	13,305
Poletimber	--	4,843	--	--	--	4,843
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	5,700	--	--	--	5,700
Total	13,305	10,543	--	--	--	23,848
Lodgepole pine:						
Sawtimber	16,090	6,404	75,927	26,675	4,843	129,939
Poletimber	8,461	8,462	21,351	20,493	--	58,767
Sapling and seedling	--	--	--	24,551	--	24,551
Nonstocked	--	--	5,946	10,067	--	16,013
Total	24,551	14,866	103,224	81,786	4,843	229,270
Western larch:						
Sawtimber	--	20,329	28,315	12,241	--	60,885
Poletimber	--	8,462	11,247	--	--	19,709
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	28,791	39,562	12,241	--	80,594
Western redcedar:						
Sawtimber	29,084	29,177	93,452	17,631	--	169,344
Poletimber	--	6,823	6,789	--	--	13,612
Sapling and seedling	--	39,030	13,819	14,729	--	67,578
Nonstocked	--	5,700	5,700	--	--	11,400
Total	29,084	80,730	119,760	32,360	--	261,934

(con.)

Table 5 (con.)

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
	Acres					
Grand fir:						
Sawtimber	25,577	141,626	189,079	77,925	--	434,207
Poletimber	4,843	--	9,686	6,823	--	21,352
Sapling and seedling	--	--	54,449	41,306	--	95,755
Nonstocked	--	13,193	--	--	--	13,193
Total	30,420	154,819	253,214	126,054	--	564,507
Spruce-subalpine Fir:						
Sawtimber	--	--	34,664	17,601	--	52,265
Poletimber	--	--	6,910	--	--	6,910
Sapling and seedling	--	--	7,906	--	--	7,906
Nonstocked	--	--	--	--	--	--
Total	--	--	49,480	17,601	--	67,081
Spruce:						
Sawtimber	--	5,946	15,372	--	--	21,318
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	5,700	--	5,700
Nonstocked	--	--	--	--	--	--
Total	--	5,946	15,372	5,700	--	27,018
Aspen:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	5,946	--	--	--	5,946
Nonstocked	--	--	--	--	--	--
Total	--	5,946	--	--	--	5,946
Cottonwood:						
Sawtimber	--	7,906	--	--	--	7,906
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	7,906	--	--	--	7,906
All types:						
Sawtimber	163,266	480,957	760,913	300,768	4,843	1,710,747
Poletimber	31,766	33,432	94,377	54,482	--	214,057
Sapling and seedling	4,843	67,869	135,952	129,197	--	337,861
Nonstocked	--	27,837	57,959	77,385	22,154	185,335
Total	199,875	610,095	1,049,201	561,832	26,997	2,448,000

Table 6.--Area of forest industry owned timberland in northern Idaho by forest type, stand-size class, and productivity class, 1981

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
	Acres					
Douglas-fir:						
Sawtimber	11,360	71,984	23,979	7,566	--	114,889
Poletimber	13,733	--	139	7,906	--	21,778
Sapling and seedling	--	5,700	6,933	12,716	--	25,349
Nonstocked	--	210	7,016	7,323	--	14,549
Total	25,093	77,894	38,067	35,511	--	176,565
Western hemlock:						
Sawtimber	--	19,711	14,923	14,816	--	49,450
Poletimber	--	--	7,906	--	--	7,906
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	19,711	22,829	14,816	--	57,356
Ponderosa pine:						
Sawtimber	7,906	1,116	6,002	6,823	--	21,847
Poletimber	--	--	--	6,910	--	6,910
Sapling and seedling	--	--	1,326	6,823	--	8,149
Nonstocked	--	--	1,327	4,244	4,771	10,342
Total	7,906	1,116	8,655	24,800	4,771	47,248
Western white pine:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	5,700	--	--	--	5,700
Total	--	5,700	--	--	--	5,700
Lodgepole pine:						
Sawtimber	--	--	19,127	500	--	19,627
Poletimber	--	--	6,823	--	--	6,823
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	25,950	500	--	26,450
Western larch:						
Sawtimber	--	13,925	8,406	7,016	--	29,347
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	13,925	8,406	7,016	--	29,347
Western redcedar:						
Sawtimber	6,910	20,715	49,595	17,631	--	94,851
Poletimber	--	6,823	6,789	--	--	13,612
Sapling and seedling	--	34,187	13,819	14,729	--	62,735
Nonstocked	--	5,700	5,700	--	--	11,400
Total	6,910	67,425	75,903	32,360	--	182,598

(con.)

Table 6 (con.)

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
	Acres					
Grand fir:						
Sawtimber	6,823	66,731	125,518	32,042	--	231,114
Poletimber	--	--	--	6,823	--	6,823
Sapling and seedling	--	--	32,181	10,721	--	42,902
Nonstocked	--	6,789	--	--	--	6,789
Total	6,823	73,520	157,699	49,586	--	287,628
Spruce-subalpine fir:						
Sawtimber	--	--	7,906	6,962	--	14,868
Poletimber	--	--	6,910	--	--	6,910
Sapling and seedling	--	--	7,906	--	--	7,906
Nonstocked	--	--	--	--	--	--
Total	--	--	22,722	6,962	--	29,684
Spruce:						
Sawtimber	--	--	6,910	--	--	6,910
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	5,700	--	5,700
Nonstocked	--	--	--	--	--	--
Total	--	--	6,910	5,700	--	12,610
Aspen:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	--	--	--
Cottonwood:						
Sawtimber	--	7,906	--	--	--	7,906
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	7,906	--	--	--	7,906
All types:						
Sawtimber	32,999	202,088	262,366	93,356	--	590,809
Poletimber	13,733	6,823	28,567	21,639	--	70,762
Sapling and seedling	--	39,887	62,165	50,689	--	152,741
Nonstocked	--	18,399	14,043	11,567	4,771	48,780
Total	46,732	267,197	367,141	177,251	4,771	863,092

Table 7.--Area of nonindustrial private timberland in northern Idaho by forest type, stand-size class, and productivity class, 1981

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
	Acres					
Douglas-fir:						
Sawtimber	55,101	108,704	172,533	58,165	--	394,503
Poletimber	--	4,842	23,944	5,946	--	34,732
Sapling and seedling	4,843	11,247	34,022	18,147	--	68,259
Nonstocked	--	3,034	--	27,511	4,843	35,388
Total	59,944	127,827	230,499	109,769	4,843	532,882
Western hemlock:						
Sawtimber	--	--	12,808	8,462	--	21,270
Poletimber	--	--	6,405	--	--	6,405
Sapling and seedling	--	--	6,404	--	--	6,404
Nonstocked	--	--	--	--	--	--
Total	--	--	25,617	8,462	--	34,079
Ponderosa pine:						
Sawtimber	4,843	68,054	93,859	52,863	--	219,619
Poletimber	4,729	--	--	6,404	--	11,133
Sapling and seedling	--	5,946	11,093	5,225	--	22,264
Nonstocked	--	--	37,970	28,240	12,540	78,750
Total	9,572	74,000	142,922	92,732	12,540	331,766
Western white pine:						
Sawtimber	13,305	--	--	--	--	13,305
Poletimber	--	4,843	--	--	--	4,843
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	13,305	4,843	--	--	--	18,148
Lodgepole pine:						
Sawtimber	16,090	6,404	56,800	26,175	4,843	110,312
Poletimber	8,461	8,462	14,528	20,493	--	51,944
Sapling and seedling	--	--	--	24,551	--	24,551
Nonstocked	--	--	5,946	10,067	--	16,013
Total	24,551	14,866	77,274	81,286	4,843	202,820
Western larch:						
Sawtimber	--	6,404	19,909	5,225	--	31,538
Poletimber	--	8,462	11,247	--	--	19,709
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	14,866	31,156	5,225	--	51,247
Western redcedar:						
Sawtimber	22,174	8,462	43,857	--	--	74,493
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	4,843	--	--	--	4,843
Nonstocked	--	--	--	--	--	--
Total	22,174	13,305	43,857	--	--	79,336

(con.)

Table 7 (con.)

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
	Acres					
Grand fir:						
Sawtimber	18,754	74,895	63,561	45,883	--	203,093
Poletimber	4,843	--	9,686	--	--	14,529
Sapling and seedling	--	--	22,268	30,585	--	52,853
Nonstocked	--	6,404	--	--	--	6,404
Total	23,597	81,299	95,515	76,468	--	276,879
Spruce-subalpine fir:						
Sawtimber	--	--	26,758	10,639	--	37,397
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	26,758	10,639	--	37,397
Spruce:						
Sawtimber	--	5,946	8,462	--	--	14,408
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	5,946	8,462	--	--	14,408
Aspen:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	5,946	--	--	--	5,946
Nonstocked	--	--	--	--	--	--
Total	--	5,946	--	--	--	5,946
Cottonwood:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	--	--	--
All types:						
Sawtimber	130,267	278,869	498,547	207,412	4,843	1,119,938
Poletimber	18,033	26,609	65,810	32,843	--	143,295
Sapling and seedling	4,843	27,982	73,787	78,508	--	185,120
Nonstocked	--	9,438	43,916	65,818	17,383	136,555
Total	153,143	342,898	682,060	384,581	22,226	1,584,908

Table 8.--Area of privately owned timberland in northern Idaho by stand volume and ownership class, 1981

Stand volume per acre[1]	Ownership class		
	Forest industry	Nonindustrial Private	Total
	- - - - - - - - - - - - Acres - - - - - - - - - - - -		
Less than 1,500 board feet	181,744	353,593	535,337
1,500 to 4,999 board feet	178,628	393,143	571,771
5,000 to 9,999 board feet	215,284	388,626	603,910
10,000 board feet or more	287,436	449,546	736,982
All classes	863,092	1,584,908	2,448,000

[1]International ¼-inch rule.

Table 9.--Area of privately owned timberland in northern Idaho by forest type and area condition class, 1981

Forest type	Area condition class									Nonstocked	All classes
	10	20	30	40	50	60	70	80	90		
	- - - - - - - - - - - -

Table 10.--Area of privately owned woodland in northern Idaho by land class, ownership class, and forest type, 1981

Ownership class	Forest type			
	Oak	Riparian woodland	Other west hardwoods	All types
	- - - - - - - - - - Acres - - - - - - - - - -			
Woodland:				
Forest industry	7,907	210	--	8,117
Nonindustrial private	4,842	22,788	5,225	32,855
Total	12,749	22,998	5,225	40,972

Table 11.--Number of growing stock trees on privately owned timberland in northern Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)															
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	- Thousand trees -															
Douglas-fir	36,301	27,006	24,123	15,921	12,747	8,752	7,234	4,330	2,643	1,321	561	412	251	96	52	141,750
Ponderosa pine	4,672	7,309	5,559	5,355	3,242	3,915	2,619	1,610	1,007	977	507	302	146	46	116	37,382
Western white pine	3,196	1.174	1,656	315	936	851	696	198	381	187	55	36	76	--	59	9,816
Lodgepole pine	15,253	9,340	16,467	15,793	6,676	4,629	1,192	475	76	59	14	--	--	--	--	69,974
Western larch	4,972	9,654	10,280	6,782	4,694	2,894	1,988	1,054	551	309	177	103	41	36	41	43,576
Grand fir	80,038	50,690	27,348	13,926	9,784	5,329	4,071	2,429	1,419	698	306	267	190	73	243	196,811
Subalpine fir	5,464	3,468	2,757	1,995	764	1,228	441	260	--	73	21	--	41	--	--	16,512
Engelmann spruce	5,109	1,870	1,903	1,126	412	298	226	169	66	50	157	69	40	17	23	11,535
Western hemlock	13,826	11,680	7,440	3,191	2,084	1,459	883	390	329	214	80	34	30	12	10	41,662
Western redcedar	48,391	21,351	14,455	7,166	5,779	3,056	2,252	1,614	883	637	582	203	113	93	420	106,995
Total softwoods	217,222	143,542	111,988	71,570	47,118	32,411	21,602	12,529	7,355	4,525	2,460	1,426	928	373	964	676,013
Aspen	4,315	3,059	1,238	309	--	52	--	41	--	39	15	--	--	--	--	9,068
Cottonwood	1,453	--	261	--	148	--	67	69	98	112	71	86	--	29	21	2,415
Total hardwoods	5,768	3,059	1,499	309	148	52	67	110	98	151	86	86	--	29	21	11,483
All species	222,990	146,601	113,487	71,879	47,266	32,463	21,669	12,639	7,453	4,676	2,546	1,512	928	402	985	687,496

Table 12.--Number of cull and salvable dead trees on privately owned timberland in northern Idaho by ownership class, and softwoods and hardwoods, 1981

Ownership class and species group	Cull trees			Salvable dead trees	All dead trees
	Sound	Rotten	Total		
	- - - - - - - - - - - - Thousand trees - - - - - - - - - - - -				
Forest industry:					
Softwoods	357	2,635	2,992	14,300	17,292
Hardwoods	--	--	--	43	43
Total	357	2,635	2,992	14,343	17,335
Nonindustrial private:					
Softwoods	--	2,410	2,410	17,747	20,157
Hardwoods	--	41	41	96	137
Total	--	2,451	2,451	17,843	20,294
Total:					
Softwoods	357	5,045	5,402	32,047	37,449
Hardwoods	0	41	41	139	180
Total	357	5,086	5,443	32,186	37,629

Table 13.--Net volume of growing stock on privately owned timberland in northern Idaho by ownership class, forest type, and stand-size class, 1981

Ownership class	Forest type	Stand-size class				
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked	All classes
		Thousand cubic feet				
Forest industry:						
	Douglas-fir	327,416	54,615	6,910	2,173	391,114
	Western hemlock	111,221	11,239	--	--	122,460
	Ponderosa pine	27,068	8,594	4,295	1,055	41,012
	Western white pine	--	--	--	--	--
	Lodgepole pine	48,171	28,702	--	--	76,873
	Western larch	102,568	--	--	--	102,568
	Western redcedar	316,319	6,294	38,470	--	361,083
	Grand fir	565,375	1,877	10,851	--	578,103
	Spruce-subalpine fir	23,244	13,172	3,025	--	39,441
	Spruce	23,998	--	--	--	23,998
	Aspen	--	--	--	--	--
	Cottonwood	24,141	--	--	--	24,141
	All types	1,569,521	124,493	63,551	3,228	1,760,793
Nonindustrial private:						
	Douglas-fir	843,132	39,443	40,490	1,649	924,714
	Western hemlock	32,223	5,388	1,515	--	39,126
	Ponderosa pine	355,696	8,880	7,798	13,555	385,929
	Western white pine	58,841	504	--	--	59,345
	Lodgepole pine	260,293	159,594	8,150	1,235	429,272
	Western larch	111,211	43,789	--	--	155,000
	Western redcedar	257,623	--	--	--	257,623
	Grand fir	430,272	20,635	10,545	--	461,452
	Spruce-subalpine fir	89,224	--	--	--	89,224
	Spruce	24,502	--	--	--	24,502
	Aspen	--	--	2,421	--	2,421
	Cottonwood	--	--	--	--	--
	All types	2,463,017	278,233	70,919	16,439	2,828,608
Total:						
	Douglas-fir	1,170,548	94,058	47,400	3,822	1,315,828
	Western hemlock	143,444	16,627	1,515	--	161,586
	Ponderosa pine	382,764	17,474	12,093	14,610	426,941
	Western white pine	58,841	504	--	--	59,345
	Lodgepole pine	308,464	188,296	8,150	1,235	506,145
	Western larch	213,779	43,789	--	--	257,568
	Western redcedar	573,942	6,294	38,470	--	618,706
	Grand fir	995,647	22,512	21,396	--	1,039,555
	Spruce-subalpine fir	112,468	13,172	3,025	--	128,665
	Spruce	48,500	--	--	--	48,500
	Aspen	--	--	2,421	--	2,421
	Cottonwood	24,141	--	--	--	24,141
	All types	4,032,538	402,726	134,470	19,667	4,589,401

Table 14.--Net volume of sawtimber on privately owned timberland in northern Idaho by ownership class, forest type, and stand-size class, 1981

Ownership class	Forest type	Stand-size class				
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked	All classes
		- - - - - - Thousand board feet, International ¼-inch rule - - - - - -				
Forest industry:						
	Douglas-fir	1,619,087	121,070	13,269	6,978	1,760,404
	Western hemlock	407,409	27,735	--	--	435,144
	Ponderosa pine	134,875	21,708	22,314	2,896	181,793
	Western white pine	--	--	--	--	--
	Lodgepole pine	165,495	56,224	--	--	221,719
	Western larch	478,353	--	--	--	478,353
	Western redcedar	1,495,674	--	130,088	--	1,625,762
	Grand fir	2,408,865	--	30,011	--	2,438,876
	Spruce-subalpine fir	112,789	28,129	8,050	--	148,968
	Spruce	138,021	--	--	--	138,021
	Aspen	--	--	--	--	--
	Cottonwood	130,635	--	--	--	130,635
	All types	7,091,203	254,866	203,732	9,874	7,559,675
Nonindustrial private:						
	Douglas-fir	3,808,695	66,530	155,584	4,522	4,035,331
	Western hemlock	144,742	6,193	--	--	150,935
	Ponderosa pine	1,707,230	15,868	34,605	70,359	1,828,062
	Western white pine	321,933	--	--	--	321,933
	Lodgepole pine	915,600	188,456	27,620	--	1,131,676
	Western larch	576,520	82,578	--	--	659,098
	Western redcedar	1,094,649	--	--	--	1,094,649
	Grand fir	1,806,494	35,998	25,984	--	1,868,476
	Spruce-subalpine fir	389,300	--	--	--	389,300
	Spruce	122,082	--	--	--	122,082
	Aspen	--	--	--	--	--
	Cottonwood	--	--	--	--	--
	All types	10,887,245	395,623	243,793	74,881	11,601,542
Total:						
	Douglas-fir	5,427,782	187,600	168,853	11,500	5,795,735
	Western hemlock	552,151	33,928	--	--	586,079
	Ponderosa pine	1,842,105	37,576	56,919	73,255	2,009,855
	Western white pine	321,933	--	--	--	321,933
	Lodgepole pine	1,081,095	244,680	27,620	--	1,353,395
	Western larch	1,054,873	82,578	--	--	1,137,451
	Western redcedar	2,590,323	--	130,088	--	2,720,411
	Grand fir	4,215,359	35,998	55,995	--	4,307,352
	Spruce-subalpine fir	502,089	28,129	8,050	--	538,268
	Spruce	260,103	--	--	--	260,103
	Aspen	--	--	--	--	--
	Cottonwood	130,635	--	--	--	130,635
	All types	17,978,448	650,489	447,525	84,755	19,161,217

Table 15.--Net volume of growing stock on privately owned timberland in northern Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)													All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand cubic feet													
Douglas-fir	72,397	100,831	141,335	165,751	193,408	157,769	125,558	77,442	41,892	36,892	28,108	11,936	12,379	1,165,698
Ponderosa pine	7,624	25,167	29,146	63,236	66,385	54,783	51,048	57,314	38,347	31,410	17,145	7,934	21,234	470,773
Western white pine	8,426	1,634	13,025	21,233	25,566	10,656	25,802	16,714	6,707	4,950	11,827	--	35,279	181,819
Lodgepole pine	89,067	148,996	101,704	107,756	35,729	21,826	3,939	3,722	1,360	--	--	--	--	514,099
Western larch	35,853	49,941	65,477	62,417	59,991	42,879	31,027	22,935	13,474	10,772	4,955	4,966	8,422	413,109
Grand fir	77,632	92,490	128,862	114,506	133,378	104,549	84,336	53,107	30,125	28,387	25,513	11,081	67,733	951,699
Subalpine fir	10,106	13,900	8,883	23,011	10,459	9,565	--	3,563	1,425	--	3,506	--	--	84,418
Engelmann spruce	6,799	6,436	5,122	6,484	6,096	5,500	4,321	3,599	15,370	7,665	5,240	3,018	4,617	80,267
Western hemlock	17,439	23,339	26,842	28,717	25,652	16,004	17,869	14,326	7,634	3,324	3,450	1,853	1,452	187,901
Western redcedar	47,853	44,641	60,722	46,297	46,554	43,452	32,165	26,916	28,224	12,060	7,420	7,435	89,325	493,064
Total softwoods	373,196	507,375	581,118	639,408	603,218	466,983	376,065	279,638	184,558	135,460	107,164	48,223	240,441	4,542,847
Aspen	3,647	2,223	--	1,016	--	1,598	--	1,889	1,011	--	--	--	--	11,384
Cottonwood	1,107	--	2,098	--	2,311	2,301	4,814	5,880	4,751	5,837	--	3,258	2,813	35,170
Total hardwoods	4,754	2,223	2,098	1,016	2,311	3,899	4,814	7,769	5,762	5,837	--	3,258	2,813	46,554
All species	377,950	509,598	583,216	640,424	605,529	470,882	380,879	287,407	190,320	141,297	107,164	51,481	243,254	4,589,401

Table 16.--Net volume of sawtimber (International ¼-inch rule) on privately owned timberland in northern Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	531,170	840,395	1,033,891	869,189	704,015	438,487	239,337	212,675	164,164	69,815	73,868	5,176,006
Ponderosa pine	99,503	290,697	352,955	308,442	301,396	341,193	231,152	190,186	103,760	50,286	135,059	2,404,629
Western white pine	50,147	118,629	145,196	59,964	142,325	92,844	37,991	28,461	68,665	--	209,772	953,994
Lodgepole pine	455,996	626,260	205,175	123,231	21,571	20,270	7,472	--	--	--	--	1,459,975
Western larch	287,064	372,576	359,624	257,076	185,883	138,157	81,563	67,787	31,043	31,067	52,088	1,863,928
Grand fir	496,856	603,609	720,678	556,383	430,170	259,448	143,102	131,278	117,016	50,756	315,652	3,824,948
Subalpine fir	38,219	121,258	55,309	50,559	--	18,711	7,854	--	19,773	--	--	311,683
Engelmann spruce	21,288	35,458	33,001	29,204	22,872	18,873	83,018	42,571	30,302	18,013	28,194	362,794
Western hemlock	107,003	141,570	133,507	85,016	95,905	77,283	42,783	18,883	19,893	10,924	8,635	741,402
Western redcedar	231,081	232,075	234,500	216,227	157,338	129,533	132,880	56,119	34,243	34,340	416,544	1,874,880
Total softwoods	2,318,327	3,382,527	3,273,836	2,555,291	2,061,475	1,534,799	1,007,152	747,960	588,859	265,201	1,238,812	18,974,239
Aspen	XXXXX	5,344	--	8,079	--	9,111	4,839	--	--	--	--	27,373
Cottonwood	XXXXX	--	12,235	11,368	23,096	30,680	24,407	29,738	--	15,019	13,062	159,605
Total hardwoods	XXXXX	5,344	12,235	19,447	23,096	39,791	29,246	29,738	--	15,019	13,062	186,978
All species	2,318,327	3,387,871	3,286,071	2,574,738	2,084,571	1,574,590	1,036,398	777,698	588,859	280,220	1,251,874	19,161,217

Table 17.--Net volume of sawtimber (Scribner rule) on privately owned timberland in northern Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand board feet, Scribner rule											
Douglas-fir	417,632	679,073	867,418	745,084	611,252	383,644	213,011	189,281	146,106	62,135	64,853	4,379,489
Ponderosa pine	66,159	219,284	285,429	255,938	255,424	290,778	198,426	165,649	90,920	44,754	120,203	1,992,964
Western white pine	42,019	98,027	124,434	52,555	125,885	82,631	33,738	25,331	61,112	--	186,697	832,429
Lodgepole pine	378,910	522,682	175,256	108,998	19,138	18,041	6,650	--	--	--	--	1,229,675
Western larch	213,366	277,141	286,044	213,551	159,537	120,969	71,612	60,293	27,629	27,649	46,358	1,504,149
Grand fir	405,572	495,714	616,884	484,367	379,606	230,495	127,360	116,802	104,144	45,173	280,930	3,287,047
Subalpine fir	30,904	98,992	46,387	43,799	--	16,463	6,990	--	17,598	--	--	261,133
Engelmann spruce	16,998	29,152	27,662	24,819	20,008	16,554	73,886	37,888	26,969	16,032	25,092	315,060
Western hemlock	84,157	114,984	114,868	74,947	85,356	68,782	37,861	16,791	17,704	9,723	7,685	632,858
Western redcedar	185,661	177,517	181,834	168,509	123,932	103,427	108,539	46,912	28,897	29,404	368,689	1,523,321
Total softwoods	1,841,378	2,712,566	2,726,216	2,172,567	1,780,138	1,331,784	878,073	658,947	521,079	234,870	1,100,507	15,958,125
Aspen	XXXXX	4,448	--	7,140	--	8,108	4,307	--	--	--	--	24,003
Cottonwood	XXXXX	--	10,555	9,911	20,453	26,921	21,703	26,467	--	13,367	11,625	141,002
Total hardwoods	XXXXX	4,448	10,555	17,051	20,453	35,029	26,010	26,467	--	13,367	11,625	165,005
All species	1,841,378	2,717,014	2,736,771	2,189,618	1,800,591	1,366,813	904,083	685,414	521,079	248,237	1,112,132	16,123,130

Table 18.--Net volume of growing stock and sawtimber (International ¼-inch rule) on privately owned timberland in northern Idaho by ownership class and species, 1981

Species	Ownership		Total
	Forest industry	Nonindustrial private	
	GROWING STOCK		
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Douglas-fir	323,118	842,580	1,165,698
Ponderosa pine	88,539	382,234	470,773
Western white pine	61,673	120,146	181,819
Lodgepole pine	84,103	429,996	514,099
Western larch	166,047	247,062	413,109
Grand fir	534,128	417,571	951,699
Subalpine fir	34,465	49,953	84,418
Engelmann spruce	24,183	56,084	80,267
Western hemlock	120,577	67,324	187,901
Western redcedar	306,503	186,561	493,064
Total softwoods	1,743,336	2,799,511	4,542,847
Aspen	4,097	7,287	11,384
Cottonwood	13,360	21,810	35,170
Total hardwoods	17,457	29,097	46,554
All species	1,760,793	2,828,608	4,589,401
	SAWTIMBER		
	- Thousand board feet, International ¼-inch rule -		
Douglas-fir	1,449,838	3,726,168	5,176,006
Ponderosa pine	489,102	1,915,527	2,404,629
Western white pine	325,457	628,537	953,994
Lodgepole pine	270,895	1,189,080	1,459,975
Western larch	817,557	1,046,371	1,863,928
Grand fir	2,166,224	1,658,724	3,824,948
Subalpine fir	127,539	184,144	311,683
Engelmann spruce	104,184	258,610	362,794
Western hemlock	488,757	252,645	741,402
Western redcedar	1,249,934	624,946	1,874,880
Total softwoods	7,489,487	11,484,752	18,974,239
Aspen	8,079	19,294	27,373
Cottonwood	62,109	97,496	159,605
Total hardwoods	70,188	116,790	186,978
All species	7,559,675	11,601,542	19,161,217

Table 19.--Net volume of sawtimber (Scribner rule) on privately owned timberland in northern Idaho by ownership class and species, 1981

Species	Ownership		Total
	Forest industry	Nonindustrial private	
	SAWTIMBER		
	- - - - Thousand board feet, Scribner rule - - - -		
Douglas-fir	1,237,238	3,142,251	4,379,489
Ponderosa pine	416,027	1,576,937	1,992,964
Western white pine	286,131	546,298	832,429
Lodgepole pine	228,946	1,000,729	1,229,675
Western larch	667,766	836,383	1,504,149
Grand fir	1,870,067	1,416,980	3,287,047
Subalpine	107,513	153,620	261,133
Engelmann spruce	90,588	224,472	315,060
Western hemlock	419,989	212,869	632,858
Western redcedar	1,022,807	500,514	1,523,321
Total softwoods	6,347,072	9,611,053	15,958,125
Aspen	7,140	16,863	24,003
Cottonwood	55,052	85,950	141,002
Total hardwoods	62,192	102,813	165,005
All species	6,409,264	9,713,866	16,123,130

Table 20.--Net volume of timber on privately owned timberland in northern Idaho by class of timber, and softwoods and hardwoods, 1981

Class of timber	Softwoods	Hardwoods	All classes
	- - - - - - Thousand cubic feet - - - - - -		
Sawtimber trees:			
Saw-log portion	3,244,517	31,423	3,275,940
Upper-stem portion	417,759	6,056	423,815
Total	3,662,276	37,479	3,699,755
Poletimber trees	880,571	9,075	889,646
All growing stock trees	4,542,847	46,554	4,589,401
Sound cull trees	1,773	--	1,773
Rotten cull trees	41,629	419	42,048
Salvable dead trees	302,707	2,830	305,537
All timber	4,888,956	49,803	4,938,759

Table 21.--Net volume of growing stock on privately owned timberland in northern Idaho by forest type and species, 1981

Forest type	Species							
	Douglas-fir	Ponderosa pine	Western white pine	Lodgepole pine	Western larch	Grand fir	Subalpine fir	Engelmann spruce
	Thousand cubic feet							
Douglas-fir	885,546	121,092	11,354	28,189	83,627	116,694	4,918	5,695
Western hemlock	8,151	--	3,539	--	15,094	14,008	2,121	--
Ponderosa pine	56,788	300,155	4,490	29,791	21,264	7,827	--	--
Western white pine	2,490	1,043	42,042	3,922	7,367	2,481	--	--
Lodgepole pine	29,960	15,817	2,488	398,174	34,518	10,040	--	1,996
Western larch	29,469	7,802	17,795	5,899	144,320	15,884	--	3,164
Western redcedar	31,813	2,992	38,991	22,002	49,670	142,359	1,732	2,593
Grand fir	114,543	11,012	56,658	19,759	45,643	639,136	6,935	4,012
Spruce-subalpine fir	2,054	--	2,532	6,363	2,718	1,621	63,869	35,073
Spruce	3,456	--	1,930	--	8,888	1,649	4,843	27,734
Aspen	--	--	--	--	--	--	--	--
Cottonwood	1,428	10,860	--	--	--	--	--	--
All types	1,165,698	470,773	181,819	514,099	413,109	951,699	84,418	80,267

Table 21 (con.)

Forest Type	Species						
	Western hemlock	Western redcedar	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	Thousand cubic feet						
Douglas-fir	6,236	47,326	1,310,677	1,725	3,427	5,152	1,315,829
Western hemlock	86,415	30,753	160,081	--	1,506	1,506	161,587
Ponderosa pine	1,064	2,018	423,397	2,499	1,045	3,544	426,941
Western white pine	--	--	59,345	--	--	--	59,345
Lodgepole pine	1,174	8,419	502,586	3,559	--	3,559	506,145
Western larch	7,117	20,614	252,064	--	5,504	5,504	257,568
Western redcedar	38,939	282,368	613,459	--	5,246	5,246	618,705
Grand fir	36,958	97,129	1,031,785	1,180	6,589	7,769	1,039,554
Spruce-subalpine fir	9,998	4,437	128,665	--	--	--	128,665
Spruce	--	--	48,500	--	--	--	48,500
Aspen	--	--	--	2,421	--	2,421	2,421
Cottonwood	--	--	12,288	--	11,853	11,853	24,141
All types	187,901	493,064	4,542,847	11,384	35,170	46,554	4,589,401

Table 22.--Net volume of sawtimber on privately owned timberland in northern Idaho by forest type and species, 1981

Forest type	Species							
	Douglas-fir	Ponderosa pine	Western white pine	Lodgepole pine	Western larch	Grand fir	Subalpine fir	Engelmann spruce
	Thousand board feet, International ¼-inch rule							
Douglas-fir	3,969,244	658,553	55,634	103,938	324,396	470,120	3,423	27,727
Western hemlock	22,591	--	11,938	--	62,643	35,292	11,235	--
Ponderosa pine	251,373	1,489,059	22,905	135,161	62,971	34,024	--	--
Western white pine	13,082	5,890	222,352	22,806	44,100	13,703	--	--
Lodgepole pine	94,525	69,092	11,360	977,262	161,456	5,482	--	--
Western larch	135,347	45,622	99,536	11,176	661,666	56,573	--	17,995
Western redcedar	143,526	15,588	229,165	106,546	277,975	584,157	9,234	9,804
Grand fir	508,091	53,391	275,754	67,176	197,146	2,608,483	25,870	19,501
Spruce-subalpine fir	10,512	--	14,704	35,910	16,087	8,300	237,893	146,396
Spruce	19,756	--	10,646	--	55,488	8,814	24,028	141,371
Aspen	--	--	--	--	--	--	--	--
Cottonwood	7,959	67,434	--	--	--	--	--	--
All types	5,176,006	2,404,629	953,994	1,459,975	1,863,928	3,824,948	311,683	362,794

Table 22 (con.)

Forest type	Species						
	Western hemlock	Western redcedar	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	Thousand board feet, International ¼-inch rule						
Douglas-fir	6,176	156,813	5,776,024	8,727	10,985	19,712	5,795,736
Western hemlock	315,426	120,086	579,211	--	6,868	6,868	586,079
Ponderosa pine	5,012	9,349	2,009,854	--	--	--	2,009,854
Western white pine	--	--	321,933	--	--	--	321,933
Lodgepole pine	4,906	16,394	1,340,477	12,918	--	12,918	1,353,395
Western larch	30,943	53,800	1,112,658	--	24,794	24,794	1,137,452
Western recedar	162,152	1,152,678	2,690,825	--	29,585	29,585	2,720,410
Grand fir	169,807	344,273	4,269,492	5,728	32,131	37,859	4,307,351
Spruce-subalpine fir	46,980	21,487	538,269	--	--	--	538,269
Spruce	--	--	260,103	--	--	--	260,103
Aspen	--	--	--	--	--	--	--
Cottonwood	--	--	75,393	--	55,242	55,242	130,635
All types	741,402	1,874,880	18,974,239	27,373	159,605	186,978	19,161,217

Table 23.--Net annual growth of growing stock and sawtimber (International ¼-inch rule) on privately owned timberland in northern Idaho by ownership class and species, 1980

Species	Ownership		Total
	Forest industry	Nonindustrial private	
	GROWING STOCK		
	Thousand cubic feet		
Douglas-fir	9,164	29,737	38,901
Ponderosa pine	1,945	15,002	16,947
Western white pine	-837	3,011	2,174
Lodgepole pine	1,893	12,164	14,057
Western larch	2,362	5,809	8,171
Grand fir	18,919	15,611	34,530
Subalpine fir	2,331	1,919	4,250
Engelmann spruce	656	1,524	2,180
Western hemlock	4,118	2,044	6,162
Western redcedar	9,936	10,541	20,477
Total softwoods	50,487	97,362	147,849
Aspen	204	1,038	1,242
Cottonwood	395	141	536
Total hardwoods	599	1,179	1,778
All species	51,086	98,541	149,627
	SAWTIMBER		
	Thousand board feet, International ¼-inch rule		
Douglas-fir	39,846	130,856	170,702
Ponderosa pine	11,426	75,846	87,272
Western white pine	2,027	21,654	23,681
Lodgepole pine	6,522	35,932	42,454
Western larch	14,701	16,535	31,236
Grand fir	63,241	62,415	125,656
Subalpine fir	2,152	3,036	5,188
Engelmann spruce	2,087	5,834	7,921
Western hemlock	14,198	7,222	21,420
Western redcedar	24,806	15,232	40,038
Total softwoods	181,006	374,562	555,568
Aspen	319	384	703
Cottonwood	1,745	-360	1,385
Total hardwoods	2,064	24	2,088
All species	183,070	374,586	557,656

Table 24.--Net annual growth of sawtimber (Scribner rule) on privately owned timberland in northern Idaho by ownership class and species, 1980

Species	Ownership		Total
	Forest industry	Nonindustrial private	
	SAWTIMBER - - - Thousand board feet, Scribner rule - - -		
Douglas-fir	36,077	118,784	154,861
Ponderosa pine	10,429	65,635	76,064
Western white pine	1,972	19,815	21,787
Lodgepole pine	6,048	32,863	38,911
Western larch	13,501	15,221	28,722
Grand fir	57,190	56,408	113,598
Subalpine fir	1,970	2,933	4,903
Engelmann spruce	1,872	5,248	7,120
Western hemlock	13,146	6,765	19,911
Western redcedar	21,254	13,132	34,386
Total softwoods	163,459	336,804	500,263
Aspen	297	346	643
Cottonwood	1,627	-168	1,459
Total hardwoods	1,924	178	2,102
All species	165,383	336,982	502,365

Table 25.--Annual mortality of growing stock and sawtimber on privately owned timberland in northern Idaho by ownership class, and softwoods and hardwoods, 1980

Species group and ownership class	Growing stock	Sawtimber	
	Thousand cubic feet	- - - - - - - Thousand board feet - - - - - - -	
		International ¼-inch rule	Scribner rule
Softwoods:			
Forest industry	8,160	28,685	24,175
Nonindustrial private	9,987	37,350	31,443
Total	18,147	66,035	55,618
Hardwoods:			
Forest industry	--	--	--
Nonindustrial private	545	2,918	2,462
Total	545	2,918	2,462
All species:			
Forest industry	8,160	28,685	24,175
Nonindustrial private	10,532	40,268	33,905
Total	18,692	68,953	58,080

Table 26.--Annual mortality of growing stock and sawtimber on privately owned timberland in northern Idaho by cause of death and species, 1980

Species	Cause of Death								Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	
	GROWING STOCK								
	Thousand cubic feet								
Douglas-fir	207	937	--	--	1,259	--	--	696	3,099
Ponderosa pine	1,647	--	--	--	192	--	--	313	2,152
Western white pine	182	2,691	--	--	--	--	--	--	2,873
Lodgepole pine	--	502	--	--	--	208	--	--	710
Western larch	1,075	616	--	--	221	--	--	362	2,274
Grand fir	1,786	3,067	--	--	125	--	70	213	5,261
Subalpine fir	--	--	--	--	--	--	--	489	489
Engelmann spruce	--	--	--	--	--	--	--	--	--
Western hemlock	--	--	--	--	--	--	223	282	505
Western redcedar	--	153	--	--	461	--	170	--	784
Total softwoods	4,897	7,966	--	--	2,258	208	463	2,355	18,147
Aspen	--	--	--	--	--	--	--	--	--
Cottonwood	--	--	--	--	--	--	--	545	545
Total hardwoods	--	--	--	--	--	--	--	545	545
All species	4,897	7,966	--	--	2,258	208	463	2,900	18,692
	SAWTIMBER								
	Thousand board feet, International ¼-inch rule								
Douglas-fir	1,012	1,542	--	--	6,851	--	--	770	10,175
Ponderosa pine	9,223	--	--	--	908	--	--	1,132	11,263
Western white pine	--	6,223	--	--	--	--	--	--	6,223
Lodgepole pine	--	2,873	--	--	--	--	--	--	2,873
Western larch	4,569	741	--	--	--	--	--	2,174	7,484
Grand fir	6,759	12,810	--	--	--	--	--	1,086	20,655
Subalpine fir	--	--	--	--	--	--	--	2,069	2,069
Engelmann spruce	--	--	--	--	--	--	--	--	--
Western hemlock	--	--	--	--	--	--	1,007	1,348	2,355
Western redcedar	--	770	--	--	2,168	--	--	--	2,938
Total softwoods	21,563	24,959	--	--	9,927	--	1,007	8,579	66,035
Aspen	--	--	--	--	--	--	--	--	--
Cottonwood	--	--	--	--	--	--	--	2,918	2,918
Total hardwoods	--	--	--	--	--	--	--	2,918	2,918
All species	21,563	24,959	--	--	9,927	--	1,007	11,497	68,953

Table 27.--Annual removals of growing stock and sawtimber on privately owned timberland in northern Idaho by ownership class and species, 1980

Species	Ownership		Total
	Forest industry	Nonindustrial private	
	GROWING STOCK		
	- - - - - - - - Thousands cubic feet - - - - - - - -		
Douglas-fir	18,702	16,681	35,383
Engelmann spruce	2,555	1,876	4,431
Lodgepole pine	1,457	4,077	5,534
Ponderosa pine	1,577	9,040	10,617
Grand fir	40,145	16,477	56,622
Western larch	8,553	6,515	15,068
Western hemlock	1,703	1,677	3,380
Western redcedar	20,596	7,965	28,561
Western white pine	9,656	8,165	17,821
Other species	9	961	970
Total	104,953	73,434	178,387
	SAWTIMBER		
	- Thousand board feet - International ¼-inch rule -		
Douglas-fir	105,967	95,241	201,208
Engelmann spruce	14,481	10,707	25,188
Lodgepole pine	7,691	22,811	30,502
Ponderosa pine	8,935	51,557	60,492
Grand fir	227,371	94,052	321,423
Western larch	48,455	37,218	85,673
Western hemlock	9,650	9,568	19,218
Western redcedar	116,683	45,484	162,167
Western white pine	54,696	46,627	101,323
Other species	53	5,486	5,539
Total	593,982	418,751	1,012,733
	SAWTIMBER		
	- - - - Thousand board feet - Scribner rule - - - -		
Douglas-fir	85,986	76,801	162,787
Engelmann spruce	11,750	8,632	20,382
Lodgepole pine	6,241	18,395	24,636
Ponderosa pine	7,250	41,573	48,823
Grand fir	184,500	75,845	260,345
Western larch	39,320	30,012	69,332
Western hemlock	7,831	7,714	15,545
Western redcedar	94,681	36,679	131,360
Western white pine	44,383	37,600	81,983
Other species	43	4,424	4,467
Total	481,985	337,675	819,660

Table 28.--Area of privately owned timberland in northern Idaho by marketing zone and ownership class, 1981

Marketing zone	Ownership class		
	Forest industry	Private	Total
	- - - - - - - - - - - - - - - Acres - - - - - - - - - - - - - - -		
Panhandle	320,527	733,937	1,054,464
Northern	542,565	850,971	1,393,536
Total	863,092	1,584,908	2,448,000

Table 29.--Net volume, net annual growth, annual mortality, and annual removals of growing stock and sawtimber on privately owned timberland in northern Idaho by marketing zone and ownership class

Marketing zone	Ownership class						Total		
	Forest industry			Nonindustrial Private					
	GROWING STOCK	SAWTIMBER		GROWING STOCK	SAWTIMBER		GROWING STOCK	SAWTIMBER	
	Thousand cubic feet	Thousand board feet International ¼-inch rule	Thousand board feet Scribner rule	Thousand cubic feet	Thousand board feet International ¼-inch rule	Thousand board feet Scribner rule	Thousand cubic feet	Thousand board feet International ¼-inch rule	Thousand board feet Scribner rule
Net volume, 1981:									
Panhandle	644,295	2,666,587	2,243,427	1,354,529	5,280,638	4,397,067	1,998,824	7,947,225	6,640,494
Northern	1,116,498	4,893,088	4,165,837	1,474,079	6,320,904	5,316,799	2,590,577	11,213,992	9,482,636
Total	1,760,793	7,559,675	6,409,264	2,828,608	11,601,542	9,713,866	4,589,401	19,161,217	16,123,130
Net annual growth, 1980:									
Panhandle	21,615	72,194	65,648	50,400	186,754	168,444	72,015	258,948	234,092
Northern	29,471	110,876	99,735	48,141	187,832	168,538	77,612	298,708	268,273
Total	51,086	183,070	165,383	98,541	374,586	336,982	149,627	557,656	502,365
Annual mortality, 1980:									
Panhandle	3,447	12,450	10,443	4,787	17,744	14,820	8,234	30,194	25,263
Northern	4,713	16,235	13,732	5,745	22,524	19,085	10,458	38,759	32,817
Total	8,160	28,685	24,175	10,532	40,268	33,905	18,692	68,953	58,080
Annual removals, 1980:									
Panhandle	10,525	58,097	47,161	37,489	213,422	170,635	48,014	271,519	217,796
Northern	94,428	535,885	434,824	35,945	205,329	167,040	130,373	741,214	601,864
Total	104,953	593,982	481,985	73,434	418,751	337,675	178,387	1,012,733	819,660

Table 30.--Area, net volume, net annual growth, annual mortality, and annual removals of growing stock and sawtimber on privately owned timberland in northern Idaho by county

County	Area, 1981	Volume, 1981			Growth, 1980		
		GROWING STOCK	SAWTIMBER		GROWING STOCK	SAWTIMBER	
		Thousand cubic feet	Thousand board feet		Thousand cubic feet	Thousand board feet	
	Acres		International ¼-inch rule	Scribner rule		International ¼-inch rule	Scribner rule
Benewah	274,953	568,060	2,376,340	1,997,863	18,481	67,263	61,094
Bonner	323,095	585,712	2,169,513	1,801,619	22,678	79,221	71,300
Boundary	144,575	248,441	930,622	771,409	10,015	34,527	31,097
Clearwater	420,317	778,924	3,389,391	2,879,938	21,692	82,797	73,952
Idaho	242,896	433,174	1,926,637	1,638,677	10,620	43,510	39,406
Kootenai	311,841	596,611	2,470,750	2,069,603	20,841	77,937	70,601
Latah	223,404	407,679	1,774,793	1,502,193	12,579	48,939	43,510
Lewis	75,304	113,242	501,890	422,030	3,956	16,268	14,321
Nez Perce	102,714	150,539	664,383	558,920	5,236	21,087	18,608
Shoshone	328,901	707,019	2,956,898	2,480,878	23,529	86,107	78,476
Total	2,448,000	4,589,401	19,161,217	16,123,130	149,627	557,656	502,365

Table 30 (con.)

County	Mortality, 1980			Removals,[1] 1980		
	GROWING STOCK	SAWTIMBER		GROWING STOCK	SAWTIMBER	
	Thousand cubic feet	Thousand board feet		Thousand cubic feet	Thousand board feet	
		International ¼-inch rule	Scribner rule		International ¼-inch rule	Scribner rule
Benewah	3,164	11,381	9,555	15,174	85,337	69,297
Bonner	1,666	6,115	5,092	14,627	82,433	65,787
Boundary	552	2,128	1,759	7,392	42,561	34,676
Clearwater	2,812	9,867	8,305	70,579	401,659	325,050
Idaho	2,282	8,930	7,823	9,308	53,124	42,672
Kootenai	2,852	10,570	8,857	10,821	61,188	48,036
Latah	1,178	4,374	3,657	18,814	106,723	86,955
Lewis	315	1,367	1,132	4,838	27,606	23,060
Nez Perce	410	1,741	1,442			
Shoshone	3,461	12,480	10,458	26,834	152,102	124,127
Total	18,692	68,953	58,080	178,387	1,012,733	819,660

[1]Includes saw logs, veneer logs, pulpwood, utility poles, house logs, posts and poles, cedar products logs, and logging residues.

Van Hooser, Dwane D. Forest statistics for private land in northern Idaho. Resource Bulletin INT-34. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1984. 38 p.

Presents land area, timberland area, timber volume, and components of change for the private lands in northern Idaho.

KEYWORDS: forest survey, timberland, inventory volume

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RESEARCH SUMMARY

Colorado's industrial roundwood production in 1982 was 21.3 million cubic feet, down 13.2 million cubic feet from the 1974 estimate. Saw log production was 20.3 million cubic feet. No round pulpwood production nor veneer log production was reported in 1982. The estimated volume of mill residues was 12.4 million cubic feet. The volume of residues used was 4.5 million cubic feet.

Colorado's Industrial Roundswood Production and Mill Residues, 1982

William H. McLain

n this report, industrial roundwood refers to all indwood products except fuel wood, and includes logs, lts, or other round sections cut from trees for industrial or consumer use and delivered to the mill, plant, or rd "in the round" (as logs or bolts). Such products lude saw logs, house logs, veneer logs or bolts, pulp od, piling, poles, posts, hewn ties, mine timbers, and celsior bolts. The word "production" is herein synonyous with "harvest."

In 1982 Colorado's production of industrial roundwood s 21.3 million cubic feet, about 45 percent of Colorado's 74 harvest and the lowest since the Forest Survey search Work Unit at Intermountain Research Station gan making periodic estimates of annual harvest g. 1). This indicates that the wood products industry Colorado in 1982 was in a recession.

Saw log production made up the bulk of the harvest th 20.3 million cubic feet (table 1), down almost 20

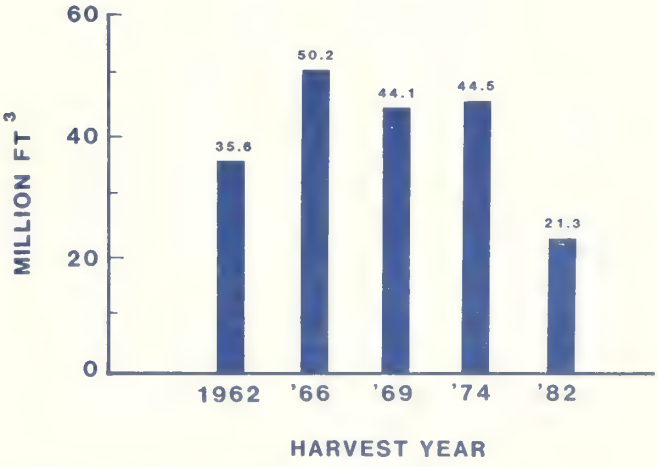

Figure 1.—Colorado's industrial roundwood harvest by selected years (Setzer and Shupe 1977; Setzer 1971; Spencer and Farrenkopf 1964).

Table 1.--Industrial roundwood products[1] harvest in Colorado by owner and product category, 1982

Owner	Saw logs	Other products	Total industrial
	Thousand cubic feet		
National Forest	16,320	533	16,853
Other public[2]	1,107	52	1,159
Private	2,852	405	3,257
Total[3]	20,279	990	21,269

[1]Round sections cut from trees for industrial or consumer use but excludes fuel wood. Industrial roundwood products in Colorado include saw logs, house logs, utility poles, posts, building poles, mine timbers, and excelsior bolts.

[2]Lands managed by public agencies other than the USDA Forest Service. Includes lands managed by the State of Colorado, the Bureau of Land Management, other Federal agencies, and counties and municipalities.

[3]Data may not add to totals due to truncating or rounding.

million cubic feet from 1974 (fig. 2). Of this, almost 56 percent was processed by mills with annual production capacities of less than 10 million board feet. There was no veneer log or pulp wood production reported for 1982. House logs, utility poles, posts and poles, mine timbers, and excelsior bolts comprised the other industrial roundwood products and totaled just under 1 million cubic feet (table 2). In 1974 the harvest of other products was 4.3 million cubic feet.

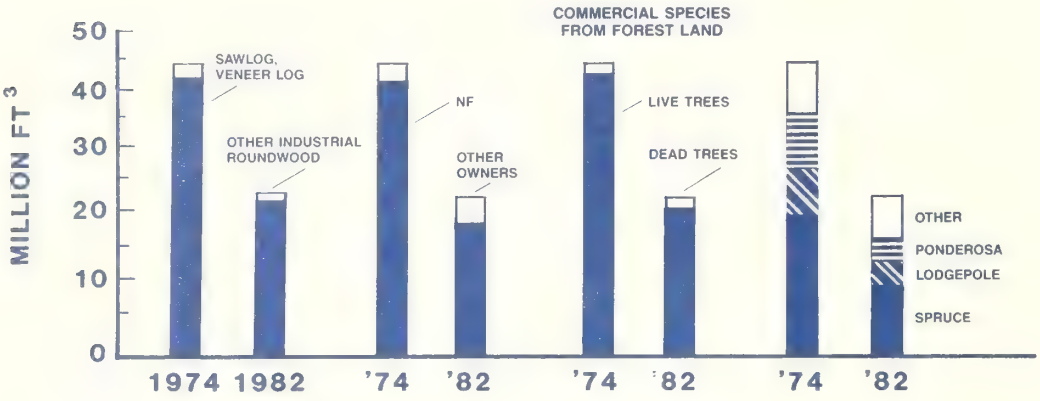

Figure 2.—A comparison of the composition of industrial roundwood production, 1974 and 1982 (Setzer and Shupe 1977).

Table 2.--Volume of industrial roundwood products from Colorado by species and product category, 1982

Species	Saw logs	Other products	Total[1] industrial
		Thousand cubic feet	
True firs	798	84	882
Juniper	--	--	--
Spruce	8,123	328	8,451
Pinyon pine	--	--	--
Lodgepole pine	2,993	430	3,423
Ponderosa pine	4,567	29	4,596
Douglas-fir	1,320	11	1,331
Cottonwood	101	50	151
Aspen	2,366	54	2,420
Other hardwoods	(1)[2]	(1)	(1)
Other softwoods	10	(1)	10
Total[2]	20,279	990	21,269

[1]Data may not add to totals due to truncating or rounding.
[2](1) = small amount.

Spruces, both Engelmann (*Picea englemannii*) and blue *Picea pungens*), accounted for just under 40 percent of roduction. Ponderosa pine (*Pinus ponderosa*), lodgepole ine (*Pinus contorta*), aspen (*Populus tremuloides*), and)ouglas-fir (*Pseudotsuga menziesii*) were the other major pecies (fig. 3).

Jackson and Montezuma Counties led all others with olumes of 3.4 million and 3 million cubic feet, respec- ively (table 3). Lodgepole pine was the leading species 1 Jackson County and aspen was the leader in Iontezuma County. The only other counties to produce

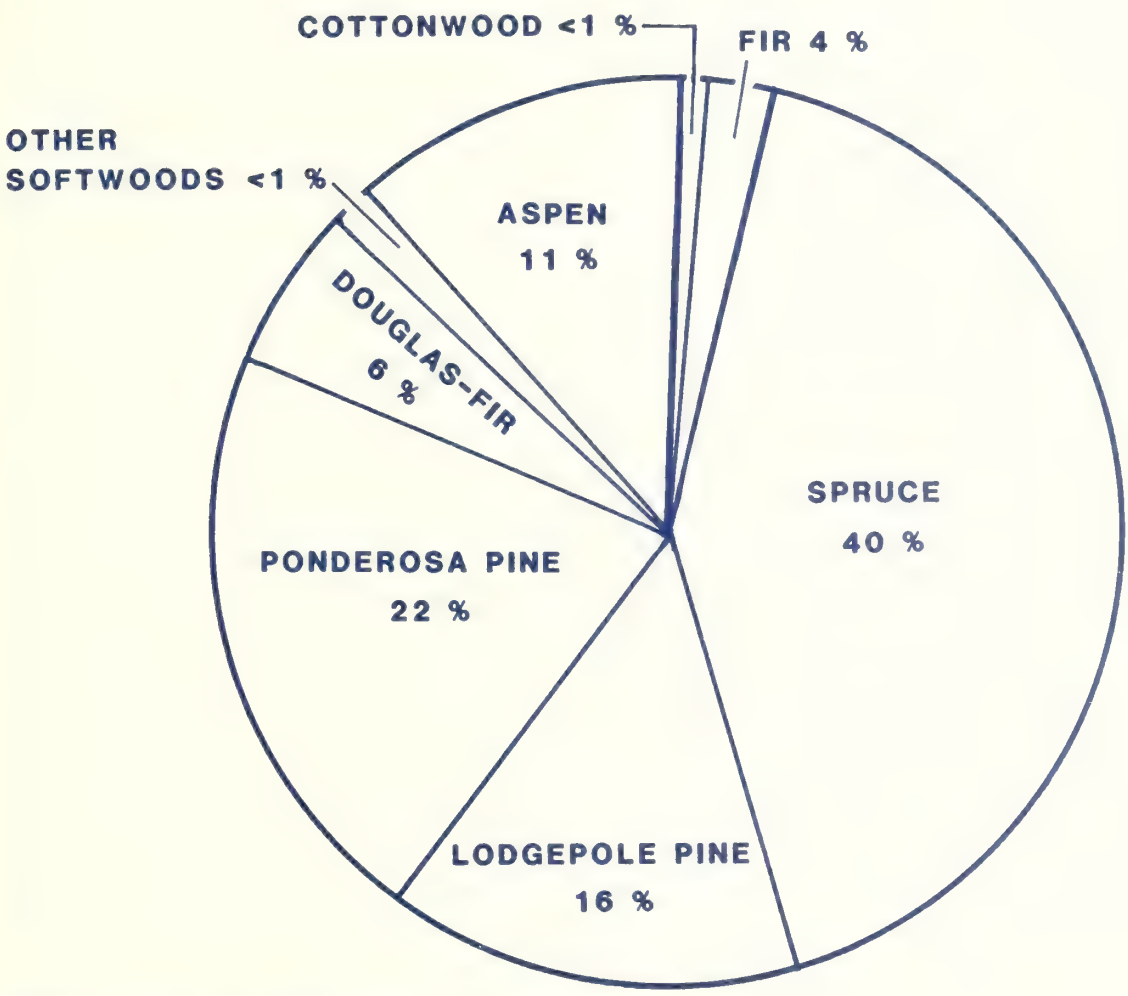

Figure 3.—Industrial roundwood products harvested in Colorado by species, 1982.

Table 3.--Volume of industrial roundwood products from Colorado by county and product category, 1982

County	Industrial roundwood products		
	Saw logs	Other products	Total[1] industrial
	Thousand cubic feet		
Alamosa	162	--	162
Archuleta	61	--	61
Boulder	103	19	122
Chaffee	51	--	51
Clear Creek	100	--	100
Conejos	234	12	246
Custer	510	--	510
Delta	188	10	198
Dolores	1,575	--	1,575
Douglas	323	--	323
Eagle	302	--	302
El Paso	93	--	93
Fremont	222	3	225
Garfield	20	80	100
Grand	97	134	231
Gunnison	321	153	474
Huerfano	363	--	363
Jackson	3,232	124	3,356
Jefferson	380	--	380
La Plata	256	--	256
Larimer	504	22	526
Las Animas	323	--	323
Mesa	356	--	356
Mineral	1,115	202	1,317
Montezuma	3,026	--	3,026
Montrose	1,561	--	1,561
Ouray	518	--	518
Park	496	162	658
Rio Blanco	--	2	2
Rio Grande	1,872	--	1,872
Routt	394	4	398
Saguache	919	49	968
San Miguel	421	8	429
Summit	36	2	38
Teller	144	--	144
Total[1]	20,279	990	21,269

[1]Data may not add to totals due to truncating or rounding.

COLORADO

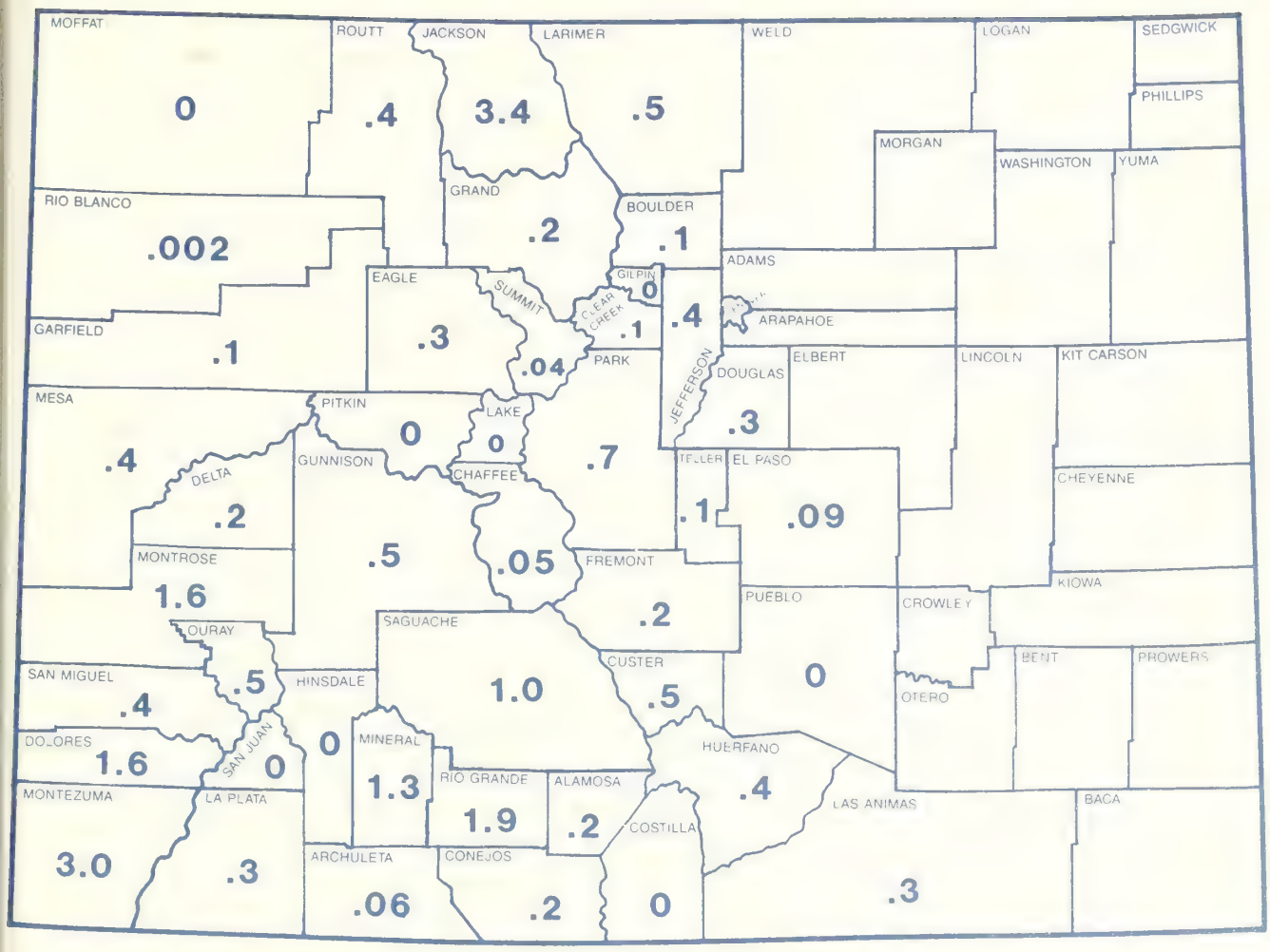

Figure 4.—Industrial roundwood production by county in millions of cubic feet, 1982.

over a million cubic feet were Rio Grande, Dolores, Montrose, and Mineral (fig. 4). Saguache County produced just under a million. La Plata County, which held the lead in industrial roundwood production in the 1969 and 1974 estimates (Setzer and Shupe 1972), produced a mere 256,000 cubic feet in 1982. Tables 4 through 9 contain other volume information by county and owner, and by county and species.

Most of the 1982 industrial roundwood product volume came from National Forest lands (79 percent) (table 1). The majority of the remaining harvest was from private and State lands. In 1974, 90 percent of the harvest came from National Forests. Ninety-two percent of the 1982 production was from standing live trees, with only 1.6 million cubic feet from dead trees.

Table 4.--Volume of industrial roundwood products from Colorado by county and owner, 1982, in cubic feet

County	Owner				Total[1] industrial
	National Forest	State	Other Federal	Private	
	Thousand cubic feet				
Alamosa	--	--	--	161	161
Archuleta	61	--	--	--	61
Boulder	105	6	--	10	121
Chaffee	51	--	--	--	51
Clear Creek	--	--	--	101	101
Conejos	226	20	--	--	246
Custer	299	20	20	171	510
Delta	171	--	--	28	199
Dolores	1,573	--	--	--	1,573
Douglas	202	--	--	121	323
Eagle	303	--	--	--	303
El Paso	--	14	--	81	95
Fremont	94	4	--	128	226
Garfield	101	--	--	--	101
Grand	153	9	43	27	232
Gunnison	390	--	--	85	475
Huerfano	180	2	--	182	364
Jackson	2,971	156	13	216	3,356
Jefferson	218	61	--	101	380
La Plata	212	--	--	44	256
Larimer	462	--	--	64	526
Las Animas	--	--	--	323	323
Mesa	259	--	12	85	356
Mineral	1,318	--	--	--	1,318
Montezuma	2,237	718	--	71	3,026
Montrose	1,272	--	--	289	1,561
Ouray	94	--	--	424	518
Park	495	--	--	161	656
Rio Blanco	--	--	--	2	2
Rio Grande	1,630	--	--	241	1,871
Routt	384	--	--	14	398
Saguache	863	--	61	44	968
San Miguel	430	--	--	--	430
Summit	8	--	--	30	38
Teller	91	--	--	53	144
Total	16,853	1,010	149	3,257	21,269

[1]Data may not add to totals due to truncating or rounding.

Table 5.--Volume of industrial roundwood products from Colorado by county and owner, Colorado, 1982, in Scribner board feet

County	Owner				Total[1] industrial
	National Forest	State	Other Federal	Private	
	Thousand board feet, Scribner				
Alamosa	--	--	--	800	800
Archuleta	300	--	--	--	300
Boulder	433	30	--	50	513
Chaffee	252	--	--	--	252
Clear Creek	--	--	--	500	500
Conejos	1,120	100	--	--	1,220
Custer	1,480	100	100	845	2,525
Delta	850	--	--	83	933
Dolores	7,800	--	--	--	7,800
Douglas	1,000	--	--	600	1,600
Eagle	1,500	--	--	--	1,500
El Paso	--	70	--	400	470
Fremont	444	20	--	636	1,100
Garfield	500	--	--	--	500
Grand	552	13	13	37	615
Gunnison	1,924	--	--	412	2,336
Huerfano	890	10	--	900	1,800
Jackson	14,716	774	62	721	16,273
Jefferson	1,080	300	--	500	1,880
La Plata	1,050	--	--	220	1,270
Larimer	2,200	--	--	296	2,496
Las Animas	--	--	--	1,600	1,600
Mesa	1,282	--	60	422	1,764
Mineral	6,530	--	--	--	6,530
Montezuma	11,090	3,560	--	350	15,000
Montrose	6,303	--	--	1,433	7,736
Ouray	465	--	--	2,100	2,565
Park	2,455	--	--	--	2,455
Rio Blanco	--	--	--	10	10
Rio Grande	8,083	--	--	1,194	9,277
Routt	1,905	--	--	70	1,975
Saguache	4,281	--	300	220	4,801
San Miguel	2,131	--	--	--	2,131
Summit	40	--	--	150	190
Teller	450	--	--	265	715
Total	83,106	4,977	535	14,814	103,448

[1]Data may not add to totals due to truncating or rounding.

Table 6.--Volume of industrial roundwood products from Colorado by county and owner, Colorado, 1982, in board feet, International ¼-inch rule

County	Owner				Total[1] industrial
	National Forest	State	Other Federal	Private	
	- - Thousand board feet, International ¼-inch rule - -				
Alamosa	--	--	--	956	956
Archuleta	358	--	--	--	358
Boulder	517	36	--	60	613
Chaffee	301	--	--	--	301
Clear Creek	--	--	--	597	597
Conejos	1,338	119	--	--	1,457
Custer	1,768	119	119	1,009	3,015
Delta	1,016	--	--	99	1,115
Dolores	9,319	--	--	--	9,319
Douglas	1,195	--	--	717	1,912
Eagle	1,792	--	--	--	1,792
El Paso	--	84	--	478	562
Fremont	530	24	--	760	1,314
Garfield	597	--	--	--	597
Grand	658	15	15	43	731
Gunnison	2,299	--	--	492	2,791
Huerfano	1,063	12	--	1,075	2,150
Jackson	17,583	925	74	861	19,443
Jefferson	1,290	358	--	597	2,245
La Plata	1,255	--	--	263	1,518
Larimer	2,629	--	--	354	2,983
Las Animas	--	--	--	1,912	1,912
Mesa	1,532	--	72	504	2,108
Mineral	7,802	--	--	--	7,802
Montezuma	13,250	4,253	--	418	17,921
Montrose	7,530	--	--	1,712	9,242
Ouray	556	--	--	2,509	3,065
Park	2,933	--	--	--	2,933
Rio Blanco	--	--	--	12	12
Rio Grande	9,657	--	--	1,427	11,084
Routt	2,276	--	--	84	2,360
Saguache	5,115	--	358	263	5,736
San Miguel	2,546	--	--	--	2,546
Summit	48	--	--	179	227
Teller	537	--	--	317	854
Total	99,290	5,945	638	17,698	123,579

[1]Data may not add to totals due to truncating or rounding.

Table 7.--Volume of industrial roundwood products from Colorado by county and species, 1982, in cubic feet

County	Species									
	True firs	Spruce	Lodgepole pine	Ponderosa pine	Douglas-fir	Cotton-wood	Aspen	Other hardwoods	Other softwoods	Total[1]
	Thousand cubic feet									
Alamosa	81	81	--	--	--	--	--	--	--	162
Archuleta	--	56	--	5	--	--	--	--	--	61
Boulder	1	4	87	30	--	--	--	--	--	122
Chaffee	--	10	--	8	33	--	--	--	--	51
Clear Creek	--	--	--	50	50	--	--	--	--	100
Conejos	33	165	2	--	42	--	4	--	--	246
Custer	16	81	--	255	153	--	--	--	5	510
Delta	10	76	10	--	--	--	102	(1)[2]	(1)	198
Dolores	--	593	48	426	--	--	508	--	--	1,575
Douglas	--	--	--	323	--	--	--	--	--	323
Eagle	16	143	143	--	--	--	--	--	--	302
El Paso	(1)	1	(1)	92	(1)	--	(1)	(1)	(1)	93
Fremont	--	114	--	90	21	--	--	--	(1)	225
Garfield	--	30	70	--	--	--	--	--	--	100
Grand	12	42	175	1	1	--	--	--	--	231
Gunnison	--	212	83	24	46	50	59	(1)	(1)	474
Huerfano	52	4	--	202	105	--	--	--	--	363
Jackson	150	1,118	2,086	2	--	--	--	--	--	3,356
Jefferson	5	19	29	186	141	--	--	--	--	380
La Plata	3	74	--	87	46	--	46	--	--	256
Larimer	7	27	183	229	80	--	--	--	--	526
Las Animas	13	14	--	269	27	--	--	--	--	323
Mesa	--	186	--	144	21	--	5	--	--	356
Mineral	149	1,015	10	24	99	--	20	--	--	1,317
Montezuma	--	868	29	811	--	--	1,313	--	5	3,026
Montrose	--	806	(1)	130	206	101	318	--	--	1,561
Ouray	--	68	--	440	8	--	2	--	--	518
Park	88	45	138	352	35	--	--	--	--	658
Rio Blanco	(1)	1	1	(1)	(1)	--	--	--	--	2
Rio Grande	166	1,562	11	--	111	--	22	--	--	1,872
Routt	12	268	112	--	--	--	6	--	--	398
Saguache	56	542	188	108	63	--	11	--	--	968
San Miguel	--	166	--	241	18	--	4	--	--	429
Summit	(1)	18	18	1	1	--	--	--	--	38
Teller	12	42	(1)	66	24	--	(1)	(1)	(1)	144
Total	882	8,451	3,423	4,596	1,331	151	2,420	(1)	10	21,269

[1]Data may not add to totals due to truncating or rounding.
[2](1) = small amount.

Table 8.--Volume of industrial roundwood products from Colorado by county and species, 1982, in board feet, Scribner

County	Species									
	True firs	Spruce	Lodgepole pine	Ponderosa pine	Douglas-fir	Cotton-wood	Aspen	Other hardwoods	Other softwoods	Total[1]
	Thousand board feet, Scribner									
Alamosa	400	400	--	--	--	--	--	--	--	800
Archuleta	--	276	--	24	--	--	--	--	--	300
Boulder	6	22	363	123	--	--	--	--	--	514
Chaffee	--	48	--	42	162	--	--	--	--	252
Clear Creek	--	--	--	250	250	--	--	--	--	500
Conejos	163	819	11	--	207	--	21	--	--	1,221
Custer	80	399	--	1,263	758	--	--	--	26	2,526
Delta	50	373	18	--	--	--	490	1	1	933
Dolores	--	2,940	238	2,105	--	--	2,518	--	--	7,801
Douglas	--	--	--	1,600	--	--	--	--	--	1,600
Eagle	80	710	710	--	--	--	--	--	--	1,500
El Paso	1	6	1	456	1	--	2	2	1	470
Fremont	--	565	--	438	97	--	--	--	--	1,100
Garfield	--	150	350	--	--	--	--	--	--	500
Grand	61	209	338	5	5	--	--	--	--	618
Gunnison	--	1,038	406	120	225	250	295	1	1	2,336
Huerfano	259	20	--	1,002	519	--	--	--	--	1,800
Jackson	742	5,546	9,982	3	--	--	--	--	--	16,273
Jefferson	26	93	142	923	697	--	--	--	--	1,881
La Plata	17	368	--	433	227	--	226	--	--	1,271
Larimer	36	134	823	1,109	395	--	--	--	--	2,497
Las Animas	66	68	--	1,334	132	--	--	--	--	1,600
Mesa	--	923	--	713	103	--	26	--	--	1,765
Mineral	740	5,030	49	120	493	--	99	--	--	6,531
Montezuma	--	4,305	143	4,021	--	--	6,507	--	25	15,001
Montrose	--	3,997	1	644	1,019	500	1,574	--	--	7,735
Ouray	--	335	--	2,184	37	--	9	--	--	2,565
Park	36	222	281	1,742	175	--	--	--	--	2,456
Rio Blanco	--	3	5	1	1	--	--	--	--	10
Rio Grande	822	7,742	55	--	548	--	110	--	--	9,277
Routt	60	1,329	555	--	--	--	32	--	--	1,976
Saguache	279	2,686	936	534	312	--	55	--	--	4,802
San Miguel	--	826	--	1,196	87	--	22	--	--	2,131
Summit	1	89	93	5	5	--	--	--	--	193
Teller	61	206	(1)[2]	326	119	--	1	(1)	(1)	713
Total	3,986	41,877	15,500	22,716	6,574	750	11,987	4	54	103,448

[1]Data may not add to totals due to truncating or rounding.
[2](1) = small amount.

Table 9.--Volume of industrial roundwood products from Colorado by county and species, 1982, in board feet, International ¼-inch rule

County	Species									
	True firs	Spruce	Lodgepole pine	Ponderosa pine	Douglas-fir	Cotton-wood	Aspen	Other hardwoods	Other softwoods	Total[1]
	Thousand board feet, International ¼-inch rule									
Alamosa	478	478	--	--	--	--	--	--	--	956
Archuleta	--	330	--	29	--	--	--	--	--	359
Boulder	7	26	433	147	--	--	--	--	--	613
Chaffee	--	58	--	50	194	--	--	--	--	302
Clear Creek	--	--	--	299	299	--	--	--	--	598
Conejos	194	978	13	--	247	--	25	--	--	1,457
Custer	96	477	--	1,508	905	--	--	--	31	3,017
Delta	60	446	22	--	--	--	585	1	1	1,115
Dolores	--	3,513	284	2,515	--	--	3,008	--	--	9,320
Douglas	--	--	--	1,912	--	--	--	--	--	1,912
Eagle	96	848	848	--	--	--	--	--	--	1,792
El Paso	2	8	1	545	2	--	3	2	1	564
Fremont	--	675	--	523	116	--	--	--	--	1,314
Garfield	--	179	419	--	--	--	--	--	--	598
Grand	74	248	400	5	5	--	--	--	--	732
Gunnison	--	1,242	485	143	268	299	352	1	1	2,791
Huerfano	309	24	--	1,197	620	--	--	--	--	2,150
Jackson	886	6,626	11,926	4	--	--	--	--	--	19,442
Jefferson	31	111	169	1,102	832	--	--	--	--	2,245
La Plata	20	440	--	517	271	--	270	--	--	1,518
Larimer	42	160	984	1,325	471	--	--	--	--	2,982
Las Animas	79	81	--	1,594	158	--	--	--	--	1,912
Mesa	--	1,103	--	852	123	--	31	--	--	2,109
Mineral	884	6,009	59	144	589	--	118	--	--	7,803
Montezuma	--	5,144	170	4,805	--	--	7,773	--	30	17,922
Montrose	--	4,776	1	769	1,218	597	1,881	--	--	9,242
Ouray	--	400	--	2,609	44	--	11	--	--	3,064
Park	42	264	335	2,081	209	--	--	--	--	2,931
Rio Blanco	--	4	5	1	1	--	--	--	--	11
Rio Grande	984	9,249	66	--	655	--	131	--	--	11,085
Routt	72	1,587	663	--	--	--	38	--	--	2,360
Saguache	334	3,209	1,118	638	373	--	65	--	--	5,737
San Miguel	--	987	--	1,429	104	--	26	--	--	2,546
Summit	2	105	111	5	5	--	--	--	--	228
Teller	73	246	(1)[2]	389	143	--	1	(1)	(1)	852
Total	4,765	50,031	18,512	27,137	7,852	896	14,318	4	64	123,579

[1]Data may not add to totals due to truncating or rounding.
[2](1) = small amount.

In line with the drop in the volume of timber harvested, mill residue volumes declined in 1982 compared to 1974 (table 10). The proportion of coarse mill residues used declined from 77 to 47 percent (fig. 5), a contrast to the observed trend of increasing utilization. About half was used by the pulp and board industries and most of the remainder was used for fuel wood.

Table 10.--A comparison of estimated volumes of used and unused residues from mills in Colorado, 1974 and 1982

Year	Residues	Total	Unused	Used
		Thousand cubic feet		
1974	Bark	5,345	2,853	1,492 (28%)
1982		2,116	1,656	460 (22%)
1974	Coarse[1]	9,003	2,070	6,933 (77%)
1982		5,704	3,036	2,668 (47%)
1974	Fine[2]	8,401	4,285	4,116 (49%)
1982		4,600	3,220	1,380 (30%)

[1]Material suitable for chipping, such as slabs, edgings, and trimmings.
[2]Sawdust and planer shavings.

The following conversion factors were used in preparing the volume figures for this report:

Product	Cubic feet	Board feet, Scribner	Board feet, International ¼	Cords
Saw logs, house logs, excelsior, and mine timbers[1]	1	4.95758	5.92320	—
Utility poles[2]	1	3.33690	3.89305	—
Posts and poles[3]	1	0	0	—
Fuel wood[4]	80	—	—	1
Mill residues[5] 1 bone dry unit =	92	—	—	1.08

[1]From logging residues data collected in Colorado in 1983.
[2]From mill canvass data, converted to cubic feet and board feet based on reported dimensions.
[3]From mill canvass data, converted to cubic feet based on reported dimensions.
[4]From estimate supplied by USDA Forest Service. Volume data supplied in numbers of cords.
[5]From Bureau of Business and Economic Research, University of Montana, Missoula.

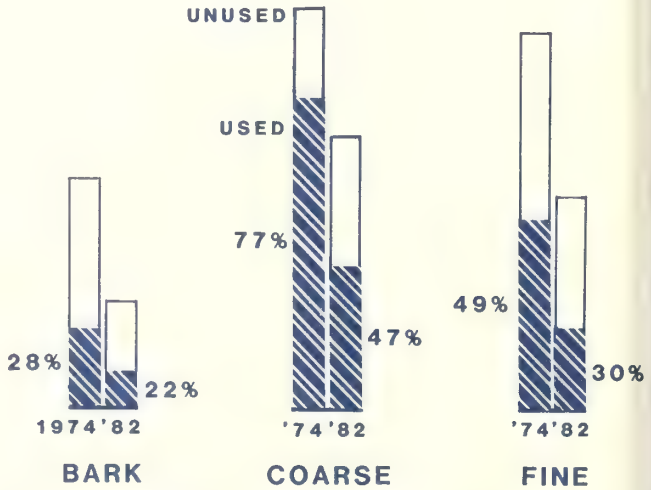

Figure 5.—A comparison of used and unused residues from mills in Colorado, 1974 and 1982. in percent.

The data for this report were obtained by canvassing primary wood-processing plants in 1983. These plants, mills, and yards were identified from the 1981 directory of Colorado sawmills and other primary wood processors prepared by the Colorado State Forest Service. The directory was reviewed and updated in the spring of 1983 by the Colorado Timber Industry Association.

Primary wood processing plants operating in 1982:

Sawmills	84
House log plants	5
Excelsior plants	1
Utility pole treating plants	1
Post and pole yards	3
Shake mills	1

REFERENCES

Setzer, Theodore S. Estimates of timber products output and plant residues, Colorado, 1969. Research Note INT-131. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1971. 4 p.

Setzer, Theodore S.; Shupe, Dorothy G. Colorado timber production and mill residues, 1974. Research Note INT-232. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1977. 7 p.

Spencer, John S.; Farrenkopf, Thomas O. Timber products output in Colorado, Wyoming, and western South Dakota, 1962. Research Paper INT-14. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1964. 18 p.

*U.S. GOVERNMENT PRINTING OFFICE: 1985-0576-040/10531

McLain, William H. Colorado's industrial roundwood production and mill residues, 1982. Resource Bulletin INT-35. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station; 1985. 13 p.

During 1983 a canvass of primary wood-processing plants in Colorado was conducted to estimate and describe (1) roundwood harvested in Colorado in 1982 and delivered to wood-processing plants and (2) the use of residues by Colorado mills.

KEYWORDS: primary wood products, sawtimber, industrial roundwood, mill residues

The Intermountain Station, headquartered in Ogden, Utah, is one of eight regional experiment stations charged with providing scientific knowledge to help resource managers meet human needs and protect forest and range ecosystems.

The Intermountain Station includes the States of Montana, Idaho, Utah, Nevada, and western Wyoming. About 231 million acres, or 85 percent, of the land area in the Station territory are classified as forest and rangeland. These lands include grasslands, deserts, shrublands, alpine areas, and well-stocked forests. They supply fiber for forest industries; minerals for energy and industrial development; and water for domestic and industrial consumption. They also provide recreation opportunities for millions of visitors each year.

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Colorado's 1982 Fuelwood Harvest

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1. The owners and operators of Colorado's primary wood processing industries.
2. The commercial fuelwood operators of Colorado who responded to our inquiries with information.
3. The members of the 381 households in Colorado who did not hang up on us.

We thank the Colorado Timber Industries Association for its assistance and endorsement of this study. Special thanks to the staffs of the many USDA Forest Service Districts and Forests in Colorado for supplying us with information and referrals.

Data were collected jointly by the Colorado State Forest Service and the Intermountain Research Station. Data compilation was done by the Bureau of Business and Economic Research at the University of Montana and by the Forest Survey Unit at the Intermountain Station.

RESEARCH SUMMARY

The estimated 1982 fuelwood harvest in Colorado was 505,000 cords (40.4 million cubic feet), about double the harvest of industrial roundwood products, and the largest annual fuelwood harvest in Colorado recorded by the Forest Survey Unit. Standing live trees of timber species from forest land composed 10 percent of this harvest; the remainder comprised dead trees, nontimber species, and trees from nonforest land.

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BACKGROUND

The Forest Survey Unit at the Intermountain Research Station is charged with making comprehensive surveys and analyses of the forest resource situation in the Rocky Mountain States (fig. 1). Periodic annual estimates and descriptions of wood harvests are part of this mission.

Wood harvest data for 1982 were collected in Colorado to coincide with the 1982 Colorado timber inventory. The timber inventory provides the data to estimate and describe the forest resource base; the wood harvest data are used to assess and describe the drain. Firewood harvest, a segment of the drain, is the focus of this report.

Residential use of firewood in the United States declined from 1880 until the mid-1970's (USDA Forest Service 1982). Since the 1973 oil embargo, the use of fuelwood as an alternative energy source has increased. A Colorado State University study (Ryan 1981) indicated a rather drastic increase in the fuelwood harvest in Colorado in the late 1970's; furthermore, a large part was harvested from privately owned lands for consumption by the woodcutters.

Figure 1.—Rocky Mountain States.

Canvasses of the timber products industry were conducted in Colorado to estimate and describe the characteristics of the timber harvests for 1962, 1969, and 1974. For those years, fuelwood harvest estimates were obtained from Federal and State agencies and supplemented with trend data from the Bureau of Census. Because the fuelwood harvest has grown in significance, more elaborate data gathering efforts were initiated to obtain the 1982 estimate of the fuelwood component of the total harvest than had been used in the three previous studies. It was apparent that if much of the firewood harvest came from private land, then polling State and Federal agencies for harvest data could result in significant underestimates. Also, whatever volume was cut by members of households for personal consumption would be missed in a canvass of the timber products industry.

Therefore, the U.S. Forest Service and the Colorado State Forest Service canvassed, by mailed questionnaires and by telephone, primary wood processing plant and commercial fuelwood harvesters to obtain data to estimate the commercial firewood harvest, as well as th harvest of sawlogs and other roundwood products. In addition, the U.S. Forest Service surveyed households i Colorado by telephone to estimate the personal-use firewood harvest.

RESULTS

In 1982 an estimated 505,000 cords of fuelwood (table 1 to 3) were harvested in Colorado. This was the largest

Table 1.--Total volume of fuelwood harvested in Colorado by land class, ownership class, and county, 1982, in cords

County	Land class and ownership class					
	Forest land					
	National Forest	BLM	State	Private	Nonforest	Total
	Cords					
Boulder	7,214	--	--	41,385	--	48,599
Chaffee	40	--	--	30	140	210
Clear Creek	--	--	--	2,866	--	2,866
Conejos	4,178	--	--	4,178	--	8,356
Delta	9,749	--	--	--	--	9,749
Denver	--	--	--	5,571	--	5,571
Dolores	1,393	--	--	--	--	1,393
Douglas	11,141	--	--	30,167	--	41,308
Eagle	270	74	--	--	--	344
Elbert	--	--	--	13,926	--	13,926
El Paso	5,570	--	205	33,426	4,624	43,825
Fremont	80	65	50	5,677	--	5,872
Garfield	2,865	--	696	7,725	--	11,286
Grand	4,815	1,105	--	7,571	--	13,491
Gunnison	120	--	--	16,913	--	17,033
Jackson	55	--	--	280	--	335
Jefferson	22,703	--	--	3,700	1,393	27,796
Kit Carson	--	--	--	--	6,964	6,964
Lake	10	--	--	30	--	40
La Plata	5,571	--	--	--	--	5,571
Larimar	13,251	--	10	24,440	--	37,701
Las Animas	--	--	--	5,571	--	5,571
Lincoln	--	--	--	9,248	4,624	13,872
Mesa	1,737	14,327	100	19,498	22,283	57,945
Mineral	--	--	--	5,571	--	5,571
Montezuma	1,393	--	--	--	--	1,393
Montrose	130	315	--	300	--	745
Morgan	--	--	--	2,785	--	2,785
Otero	--	--	--	5,571	--	5,571
Park	912	--	--	330	--	1,242
Pitkin	1,338	--	--	--	--	1,338
Pueblo	4,178	--	--	12,534	110	16,822
Rio Blanco	40	18	--	5	--	63
Routt	45,959	--	--	13,258	--	59,217
Saguache	225	--	--	--	--	225
San Miguel	--	--	--	20	--	20
Summit	225	--	90	25	--	340
Teller	12,854	--	--	11,298	--	24,152
Weld	--	--	--	2,786	--	2,786
Yuma	--	--	--	2,785	--	2,785
TOTAL	158,016	15,904	1,151	289,470	40,138	504,679

Table 2.--Total volume of fuelwood harvested in Colorado by land class, ownership class, and species, 1982, in cords

Species	Land class and ownership class					
	Forest land					
	National Forest	BLM	State	Private	Nonforest	Total
	Cords					
True firs	2,461	--	--	125	--	2,586
Spruce	7,120	24	100	181	--	7,425
Lodgepole pine	22,237	1,220	100	42,016	--	65,573
Ponderosa pine	80,218	13,977	194	120,821	--	215,210
Douglas-fir	288	--	11	3,350	--	3,649
Cottonwood	--	--	--	64,414	120	64,534
Aspen	36,862	200	50	27,267	100	64,479
Juniper	--	100	--	9,276	--	9,376
Pinyon	8,808	383	696	20,926	--	30,813
Fruit trees	--	--	--	--	22,283	22,283
Oak	16	--	--	1,058	--	1,074
Other hardwoods	6	--	--	36	17,635	17,677
TOTAL	158,016	15,904	1,151	289,470	40,138	504,679

fuelwood harvest in Colorado ever recorded by the Forest Survey Unit at the Intermountain Station since it began making periodic estimates of annual harvest (fig. 2). At a conversion rate of 80 cubic feet of wood per cord, this amounts to about 40.4 million cubic feet, almost double the Colorado harvest of sawlogs and other industrial roundwood products (21.3 million cubic feet) (McLain 1985).

Of the fuelwood harvest, 57 percent was from private land, 31 percent from National Forests, almost 8 percent from nonforest lands (orchards, city parks, urban areas, and wind breaks), and the remainder from Bureau of Land Management (BLM) and State lands.

The most heavily harvested species was ponderosa pine with 43 percent of the cut, followed by lodgepole pine, cottonwood, and aspen with about 13 percent each.

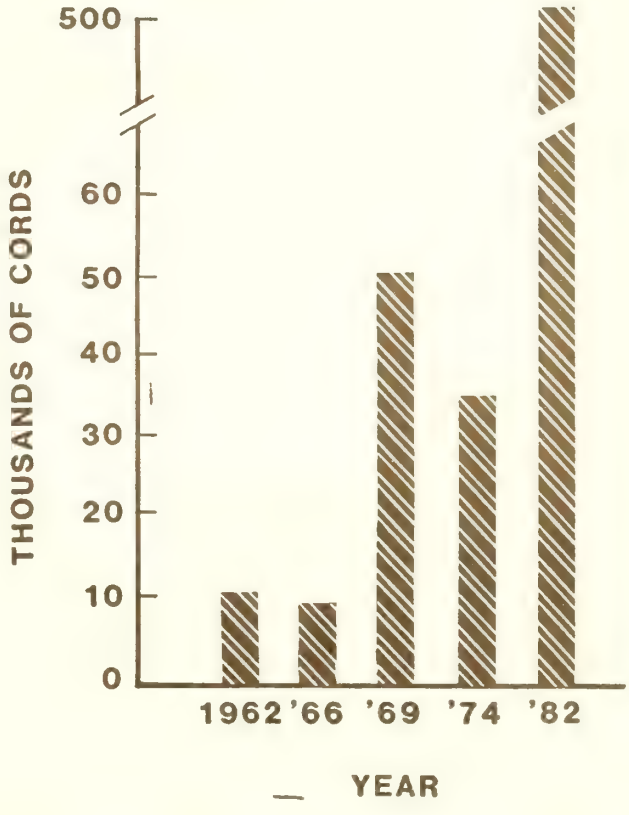


Figure 2.—Colorado fuelwood harvest, five annual estimates. The 1969 and 1974 estimates include post and corral pole volumes (sources: Setzer and Shupe 1977; Setzer 1971; Setzer and Wilson 1970; Spencer and Farrenkopf 1964).

Table 3.--Total volume of fuelwood harvested in Colorado by species and county, 1982, in cords

County	Species												Total
	True firs	Spruce	Lodgepole pine	Ponderosa pine	Douglas-fir	Cottonwood	Aspen	Juniper	Pinyon	Fruit trees	Oak	Other hardwoods	
	Cords												
Boulder	--	--	185	48,363	15	--	--	--	--	--	--	36	48,599
Chaffee	--	40	30	--	--	40	100	--	--	--	--	--	210
Clear Creek	--	20	--	1,423	30	--	1,393	--	--	--	--	--	2,866
Conejos	--	--	--	4,178	--	--	4,178	--	--	--	--	--	8,356
Delta	--	--	--	--	--	--	9,749	--	--	--	--	--	9,749
Denver	--	--	--	5,571	--	--	--	--	--	--	--	--	5,571
Delores	--	--	--	--	--	--	1,393	--	--	--	--	--	1,393
Douglas	--	--	--	32,255	--	--	9,053	--	--	--	--	--	41,308
Eagle	100	74	120	--	--	--	--	--	50	--	--	--	344
Elbert	--	--	--	2,785	--	11,141	--	--	--	--	--	--	13,926
El Paso	100	--	--	24,768	211	4,624	4,874	4,624	--	--	--	4,624	43,825
Fremont	--	40	5,626	75	--	--	88	28	15	--	--	--	5,872
Garfield	25	105	--	--	--	7,660	2,785	--	711	--	--	--	11,286
Grand	50	375	13,066	--	--	--	--	--	--	--	--	--	13,491
Gunnison	--	22	5,607	6	56	5,571	5,771	--	--	--	--	--	17,033
Jackson	--	25	310	--	--	--	--	--	--	--	--	--	335
Jefferson	--	--	185	23,056	377	--	2,785	--	--	--	--	1,393	27,796
Kit Carson	--	--	--	--	--	--	--	--	--	--	--	6,964	6,964
Lake	--	20	15	--	--	--	5	--	--	--	--	--	40
La Plata	--	5,571	--	--	--	--	--	--	--	--	--	--	5,571
Larimer	1,843	81	17,569	13,265	2,960	5	1,978	--	--	--	--	--	37,701
Las Animas	--	--	--	--	--	5,571	--	--	--	--	--	--	5,571
Lincoln	--	--	--	--	--	4,624	--	4,624	--	--	--	4,624	13,872
Mesa	--	100	100	29,247	--	--	6,105	100	--	22,283	10	--	57,945
Mineral	--	--	--	--	--	--	--	--	5,571	--	--	--	5,571
Montezuma	--	--	--	--	--	--	1,393	--	--	--	--	--	1,393
Montrose	--	130	--	--	--	150	150	--	315	--	--	--	745
Morgan	--	--	--	--	--	2,785	--	--	--	--	--	--	2,785
Otero	--	--	--	--	--	5,571	--	--	--	--	--	--	5,571
Park	10	142	115	650	--	--	325	--	--	--	--	--	1,242
Pitkin	446	446	--	--	--	--	--	--	446	--	--	--	1,338
Pueblo	--	--	--	--	--	12,614	--	--	4,178	--	--	30	16,822
Rio Blanco	--	40	--	--	--	--	--	--	23	--	--	--	63
Routt	--	--	20,891	19,498	--	--	9,414	--	8,356	--	1,058	--	59,217
Saguache	--	50	50	--	--	--	125	--	--	--	--	--	225
San Miguel	--	10	--	--	--	--	10	--	--	--	--	--	20
Summit	--	35	305	--	--	--	--	--	--	--	--	--	340
Teller	12	99	6	10,070	--	--	2,805	--	11,148	--	6	6	24,152
Weld	--	--	1,393	--	--	1,393	--	--	--	--	--	--	2,786
Yuma	--	--	--	--	--	2,785	--	--	--	--	--	--	2,785
TOTAL	2,586	7,425	65,573	215,210	3,649	64,534	64,479	9,376	30,813	22,283	1,074	17,677	504,679

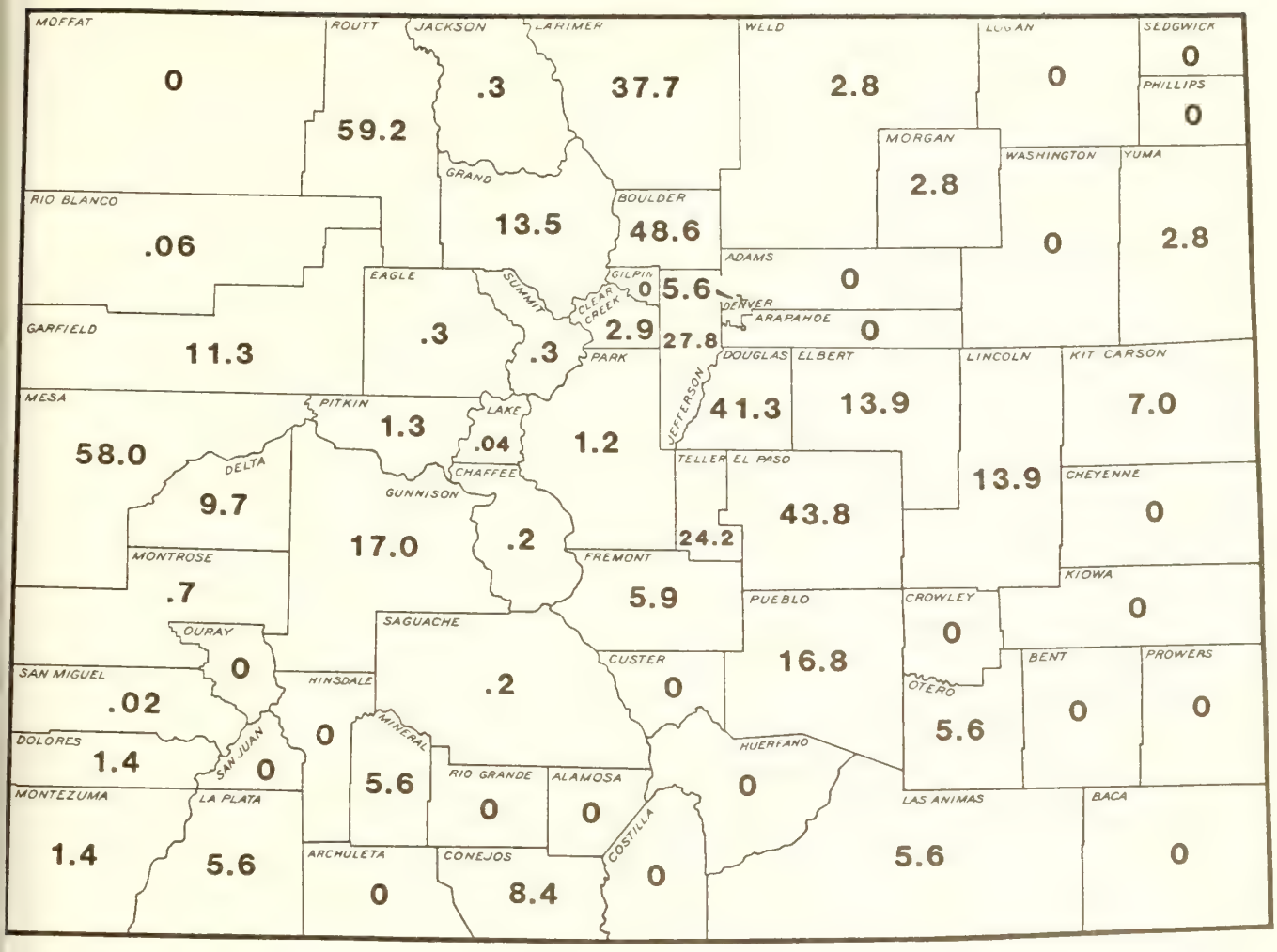


Figure 3.—Fuelwood harvest by county in thousands of cords, 1982.

The leading counties in fuelwood production were Routt, Mesa, Boulder, El Paso, Douglas, and Larimer. Each produced more than 30,000 cords (fig. 3).

The fuelwood harvest of standing live trees of timber species[1] from forest land[2] was less than 50,000 cords (tables 4 and 5), roughly 10 percent of the total fuelwood harvest. This converts to about 4 million cubic feet or 19 percent of the volume harvested in Colorado in 1982 for sawlogs and other industrial roundwood products. Most of this standing live fuelwood harvest came from private land in Douglas, Mesa, Jefferson, Larimer, and Denver Counties (tables 4 and 7).

Shade trees, fruit trees, and other trees from nonforest land totaled 40,000 cords. The volume of the nontimber species, pinyon, juniper, oak, and other hardwoods harvested from forest land was 41,000 cords. The remainder

[1]Includes tree species traditionally harvested for lumber products. Excludes pinyon pine, juniper, and miscellaneous hardwoods such as oaks, shade trees, ornamentals, and fruit trees.

[2]Excludes orchards, city parks, urban areas, and wind breaks.

Table 4.--Total volume of fuelwood harvested from live trees in Colorado by species and county, 1982, in cords

County	Species										
	True firs	Spruce	Lodgepole pine	Ponderosa pine	Douglas-fir	Cottonwood	Aspen	Juniper[1]	Pinyon[1]	Oak and other hardwoods[1]	Total
	Cords										
Boulder	--	--	185	369	2	--	--	--	--	4	560
Clear Creek	--	--	--	28	28	--	--	--	--	--	56
Denver	--	--	--	3,343	--	--	--	--	--	--	3,343
Douglas	--	--	--	14,485	--	--	6,964	--	--	--	21,449
Eagle	--	--	--	--	--	--	--	--	50	--	50
El Paso	80	--	--	346	171	925	--	4,624	--	925	7,071
Fremont	--	--	--	50	--	--	45	17	--	--	112
Garfield	19	19	--	--	--	--	--	--	--	--	38
Grand	--	151	432	--	--	--	--	--	--	--	583
Gunnison	--	11	18	3	28	--	180	--	--	--	240
Jackson	--	20	220	--	--	--	--	--	--	--	240
Jefferson	--	--	176	3,283	351	--	--	--	--	--	3,810
Lake	--	2	--	--	--	--	5	--	--	--	7
Larimer	5	37	1,409	2,154	30	--	140	--	--	--	3,775
Lincoln	--	--	--	--	--	925	--	4,624	--	925	6,474
Mesa	--	50	50	7,730	--	--	3,219	40	--	10	11,099
Montrose	--	--	--	--	--	150	150	--	300	--	600
Park	10	138	105	587	--	--	239	--	--	--	1,079
Pueblo	--	--	--	--	--	28	--	--	--	30	58
Saguache	--	40	40	--	--	--	43	--	--	--	123
Summit	--	35	210	--	--	--	--	--	--	--	245
Teller	12	97	6	310	--	--	19	--	6	12	462
TOTAL	126	600	2,851	32,688	610	2,028	11,004	9,305	356	1,906	61,474

[1]Not timber species.

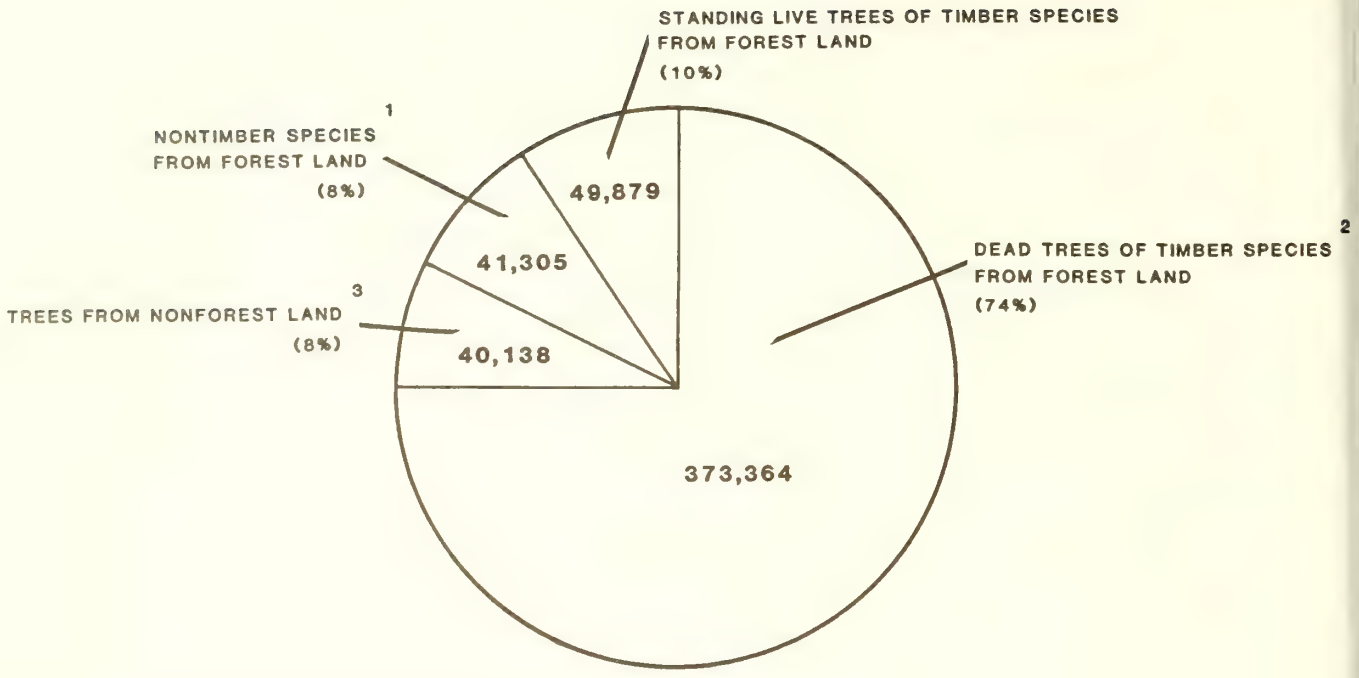
Table 5.--Total volume of fuelwood harvested from live trees in Colorado by land class, ownership class, and species, 1982, in cords

Species	Land class and ownership class					
	Forest land					
	National Forest	BLM	State	Private	Nonforest	Total
	Cords					
True firs	27	--	--	99	--	126
Spruce	467	--	50	83	--	600
Lodgepole pine	1,500	326	45	980	--	2,851
Ponderosa pine	9,245	50	186	23,207	--	32,688
Douglas-fir	170	--	11	429	--	610
Cottonwood	--	--	--	2,000	28	2,028
Aspen	756	100	45	10,103	--	11,004
Juniper[1]	--	40	--	9,265	--	9,305
Pinyon[1]	6	350	--	--	--	356
Oak and other hardwoods[1]	22	--	--	4	1,880	1,906
TOTAL	12,193	866	337	46,170	1,908	61,474

[1]Not timber species.

Table 6.--Total volume of fuelwood harvested from dead trees in Colorado by land class, ownership class, and species, 1982, in cords

Species	Land class and ownership class					
	Forest land					
	National Forest	BLM	State	Private	Nonforest	Total
	Cords					
True firs	2,434	--	--	26	--	2,460
Spruce	6,653	24	50	99	--	6,826
Lodgepole pine	20,737	894	55	41,036	--	62,722
Ponderosa pine	70,976	13,927	8	97,616	--	182,527
Douglas-fir	118	--	--	2,922	--	3,040
Cottonwood	--	--	--	62,414	92	62,506
Aspen	36,107	100	5	17,163	100	53,475
Juniper	--	60	--	11	--	71
Pinyon pine	8,802	33	696	20,926	--	30,457
Fruit trees	--	--	--	--	22,283	22,283
Oak	--	--	--	1,058	--	1,058
Other hardwoods	--	--	--	32	15,755	15,787
TOTAL	145,827	15,038	814	243,303	38,230	443,212



[1]Both dead and live. Nontimber species consist of pinyon, juniper, and all hardwoods except cottonwood and aspen. Forest land—land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use.

[2]Timber species—those species that are usually desirable for conversion into conventional timber products, such as lumber, plywood, and pulp.

[3]Includes timber species and nontimber species, both dead and live. Nonforest land consists of orchards, city parks, urban areas, and wind breaks.

Figure 4.—Total fuelwood harvest in Colorado by land class and species class, 1982, in cords and percent.

of the harvest, about 373,000 cords, was cut from dead trees of timber species on forest land (fig. 4 and table 6).

Over 486,000 cords were cut by members of households for personal consumption. Commercial fuelwood operators[3] reported harvesting about 18,000 cords, less than 4 percent of the total.

Because the personal use[4] fuelwood harvest was 96 percent of the total (commercial and household) fuelwood harvest, the previously stated highlights of volume and percentages by species, county, and other categories describe this personal use cut. However, the fuelwood harvest by commercial operators, though small as a proportion of the total fuelwood harvest, bears some significant differences in composition from the personal use harvest. Of the 18,000 cords harvested by commercial operators, almost 10,000 cords, or 54 percent, came from live trees. Further, almost 9,000 cords, or 48 percent, came from standing live trees of timber species on forest land. Commercial operators cut more lodgepole pine, over 7,000 cords (75 percent of which was dead), than ponderosa pine, 5,600 cords (16 percent of which was dead). Slightly over 51 percent of the commercial fuelwood harvest came from Grand (5,000 cords) and Jefferson (4,000 cords) Counties.

An analysis of the impacts of fuelwood harvesting and demand on forest land management and competition for wood within the forest products industry was made by Betters and others (1984).

SURVEY PROCEDURES

Fuelwood harvest data were collected from two distinct groups: commercial operators who harvest fuelwood and other roundwood products to sell to consumers or retail outlets; and members of households who harvest fuelwood and consume it. These two populations were surveyed in different ways.

Fuelwood Harvest by Commercial Operators

A 100 percent canvass of commercial operators was attempted to obtain the data from this population. Commercial fuelwood operators comprise multiproduct roundwood harvesters and those who harvest strictly, or predominantly, fuelwood.

Primary wood processing plants, such as sawmills, were canvassed to obtain the multiproduct roundwood data that included fuelwood. These plants (mills and

[3]Those who harvest fuelwood to sell to dealers or consumers. Includes loggers who harvest fuelwood along with sawlogs and other products.

[4]Cut by members of households for personal consumption. Sometimes referred to as "residential."

Table 7.--Total volume of fuelwood harvested from live trees in Colorado by land class, ownership class, and county, 1982, in cords

County	Land class and ownership class					
	Forest land					
	National Forest	BLM	State	Private	Nonforest	Total
	Cords					
Boulder	250	--	--	310	--	560
Clear Creek	--	--	--	56	--	56
Denver	--	--	--	3,343	--	3,343
Douglas	7,521	--	--	13,928	--	21,449
Eagle	--	50	--	--	--	50
El Paso	--	--	197	5,949	925	7,071
Fremont	--	50	45	17	--	112
Garfield	--	--	--	38	--	38
Grand	307	276	--	--	--	583
Gunnison	60	--	--	180	--	240
Jackson	44	--	--	196	--	240
Jefferson	389	--	--	3,421	--	3,810
Lake	--	--	--	7	--	7
Larimer	1,047	--	--	2,728	--	3,775
Lincoln	--	--	--	5,549	925	6,474
Mesa	1,110	190	50	9,749	--	11,099
Montrose	--	300	--	300	--	600
Park	839	--	--	240	--	1,079
Pueblo	--	--	--	--	58	58
Saguache	123	--	--	--	--	123
Summit	195	--	45	5	--	245
Teller	308	--	--	154	--	462
TOTAL	12,193	866	337	46,170	1,908	61,474

yards) were identified from the 1981 directory of Colorado sawmills and other primary wood processors prepared by the Colorado State Forest Service. The directory was reviewed and updated in the spring of 1983 by the Colorado Timber Industry Association. A rather small part of the commercial fuelwood harvest volume was reported in the course of this canvass.

Most of the commercial fuelwood harvest data were obtained from a canvass of individuals and businesses identified, prospectively, as commercial fuelwood operations. A register of these potential harvesters was compiled from USDA Forest Service Rocky Mountain Region's bidders lists and telephone book yellow page listings. Of those identified as potential 1982 commercial fuelwood harvesters, 63 responded with harvest data. Many others proved not to be harvesters in 1982.

Though diligent effort was made to locate and canvass all commercial operators, certainly some were missed. How many? We don't know. We would conclude, though, that the volume of fuelwood harvested by commercial operators was a small proportion of the total volume of fuelwood harvested in Colorado in 1982.

Fuelwood Harvest by Members of Households For Personal Use

Personal use fuelwood harvest estimates were obtained by interviewing residents of 381 households in Colorado via telephone. The population sampled consisted of all residential listings in all Colorado telephone books. A random number generator was used to select the sample, which was distributed throughout the telephone books proportional to the populations of households (residences) within the books.[5] Of the 381 households surveyed, 63 reported fuelwood harvests for 1982. The other 318 reported they did not harvest.

The following procedure was used to expand the sample statistics to obtain the estimate of the total volume of fuelwood harvested by all the households in Colorado:

n = number of households in sample

nc = number of households in sample that harvested fuelwood

$\overline{X}$ = mean harvest, in cords, by nc

N = estimated population of residences (households) in all the telephone books in Colorado

NC = estimated number of households within the telephone book population that harvested fuelwood

$$NC = N \frac{nc}{n}$$

VOL = estimated volume of fuelwood harvested by N

$VOL = NC (\overline{X})$

P = Bureau of Census estimate of the population of households in Colorado

K = population adjustment factor; used to expand the estimate of harvest by the telephone book population to the estimate of harvest by the population of Colorado

$$K = \frac{P}{N}$$

TOT VOL = estimate of the total volume harvested by members of households for personal consumption in Colorado

TOT VOL = VOL(K)

For the 1982 harvest of fuelwood by households, the following were computed:

n = 381

nc = 63

$\overline{X}$ = 2.77

N = 949,313

NC = 156,973

VOL = 435,388

P = 1,061,249

K = 1.11791

TOT VOL = 486,726 cords (differs from tables due to rounding)

The variance, standard error, and confidence interval the estimate of the total volume harvested by households are found as follows:

VAR = variance of the volume harvested by the sa ple; computed using the number of households that harvested (nc)

VAR TOT VOL = variance of the total volume

$$\text{VAR TOT VOL} = \frac{(\overline{X})^2 (NC) (N-NC)}{n} + \frac{(NC)^2 (VAR)}{nc}$$

Std. error TOT VOL = standard error of the total volume = $\sqrt{\text{VAR TOT VOL}}$

For 95 percent confidence interval of the estimate of t total volume:

TOT VOL ± 2 (std. error TOT VOL)

For the 1982 harvest of fuelwood by households, the following statistics were calculated:

VAR TOT VOL = 5,272,843,737

Std. error TOT VOL = 72,614

95 percent confidence interval = ±145,229

Sample Size

A pilot sample of 100 households provided estimate used to calculate sample size. The following definition and formulas were used:

n = sample size (total number of households in Colorado sampled)

n_1 = number of households in the pilot sample

nc_1 = number of households in the pilot sample that harvested firewood

nc = the estimate of the number of households in t final sample that would respond that they had harvest firewood

Z = the value from a table of the normal distributio corresponding to the desired probability level (Z = 1.9 at the 95 percent level)

P^* = the proportion of the total volume harvested that is specified as the allowable error

$\hat{NC}_1$ = estimate of the total number of households in the population that harvested firewood

x = volume, in cords, harvested by an individual household in pilot sample

$\overline{x}_1$ = mean volume harvested by nc_1 (households in t pilot sample that harvested)

N = total number of households in the population from which the sample was drawn (population of house holds in Colorado; from Bureau of Census)

S_1^2 = variance of the volume harvested by the pilot sample; computed using the number of households tha harvested (nc_1)

[5]Copies of the program used to select the actual samples are available from the authors.

ing the above definitions, the following relationships ld:

$$\bar{x}_1 = \frac{\Sigma x}{nc_1}$$

$$S_1^2 = \frac{\Sigma X^2 - \frac{(\Sigma X)^2}{nc_1}}{nc^1 - 1}$$

$$C_1 = \frac{nc_1}{n_1} N$$

$$A = \bar{x}_1^2 \hat{N}C_1 (N - \hat{N}C_1) \frac{nc_1}{n_1} + \hat{N}C_1 S_1^2$$

$$B = \hat{N}C_1^2 \bar{x}_1^2$$

$$nc > \frac{Z^2 A}{p^{*2} B}$$ (This should be rounded to the next largest whole number)

$$n = nc \frac{n_1}{nc_1}$$

REFERENCES

Betters, David R.; Wilcox, William R.; Ryan, Phyllis P. Domestic fuelwood utilization and resources management in Colorado. Journal of Forestry. 82(8): 484-487; 1984.

McLain, William H. Colorado's industrial roundwood production and mill residues, 1982. Resource Bulletin INT-35. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station; 1985. 13 p.

Ryan, Phyllis P. Characteristics and trends of domestic fuelwood use in the State of Colorado. Fort Collins, CO: Colorado State University, Department of Forest and Wood Sciences; 1981. 147 p. Thesis.

Setzer, Theodore S. Estimates of timber products output and plant residues, Colorado, 1969. Research Note INT-131. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1971. 4 p.

Setzer, Theodore S.; Shupe, Dorothy G. Colorado timber production and mill residues, 1974. Research Note INT-232. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1977. 7 p.

Setzer, Theodore S.; Wilson, Alvin K. Timber products in the Rocky Mountain States, 1966. Resource Bulletin INT-9. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1970. 89 p.

Spencer, John S.; Farrenkopf, Thomas O. Timber products output in Colorado, Wyoming, and Western South Dakota, 1962. Research Paper INT-14. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1964. 18 p.

U.S. Department of Agriculture, Forest Service. An analysis of the timber situation in the United States 1952-2030. Forest Resource No. 23. Washington, DC: U.S. Department of Agriculture, Forest Service; 1982. 499 p.

McLain, William H. Colorado's 1982 fuelwood harvest. Resource Bulletin INT-36. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station; 1985. 11 p.

During 1983, primary wood processing plants and commercial fuelwood operators were canvassed and household residents surveyed to obtain estimates and characteristics of the 1982 fuelwood harvest in Colorado.

KEYWORDS: firewood, fuelwood, roundwood harvest

The Intermountain Research Station, headquartered in Ogden, Utah, is one of eight Forest Service Research stations charged with providing scientific knowledge to help resource managers meet human needs and protect forest and range ecosystems.

The Intermountain Station's primary area includes Montana, Idaho, Utah, Nevada, and western Wyoming. About 231 million acres, or 85 percent, of the land area in the Station territory are classified as forest and rangeland. These lands include grasslands, deserts, shrublands, alpine areas, and well-stocked forests. They supply fiber for forest industries; minerals for energy and industrial development; and water for domestic and industrial consumption. They also provide recreation opportunities for millions of visitors each year.

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Idaho's State and Private Forest Resource

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RESEARCH SUMMARY

The State and private forest land base in Idaho amounts to 4.6 million acres of which nearly 4.2 million is classed as timberland. These acres support nearly 8 billion cubic feet of growing stock, including 34 billion board feet of sawtimber. The overall outlook for this resource is positive although a serious overcutting situation may be developing in the northern part of the State. This report presents additional information on total land area, timberland area, timber inventory, annual growth, mortality, and removals.

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Idaho's State and Private Forest Resource

Dwane D. Van Hooser
Alan W. Green

NTRODUCTION

This bulletin presents the findings of the most recent orest Survey of Idaho's privately owned forest resources. his survey was begun with prefield work in January 980 and ended in May 1984 with the finished data com- ilation. The field phase of the survey required two easons—the first from May to November 1980, the econd from mid-May through September 1981.

The information on State lands in this bulletin was upplied by the Idaho Department of Lands and refor- natted by the Forest Survey Research Work Unit in gden, UT.

The data in this report pertain only to the State and private forest resource base, and will be presented for the State as a whole, by individual survey unit (fig. 1), by individual county, and by the four major marketing zones (fig. 2). Data for lands administered by various public agencies such as National Forest Systems and Bureau of Land Management will be included in a subsequent, comprehensive report that will include all lands and all owners.

The primary objective of Forest Survey—a continuing, nationwide undertaking of the Forest Service, U.S. Department of Agriculture—is to provide an assessment

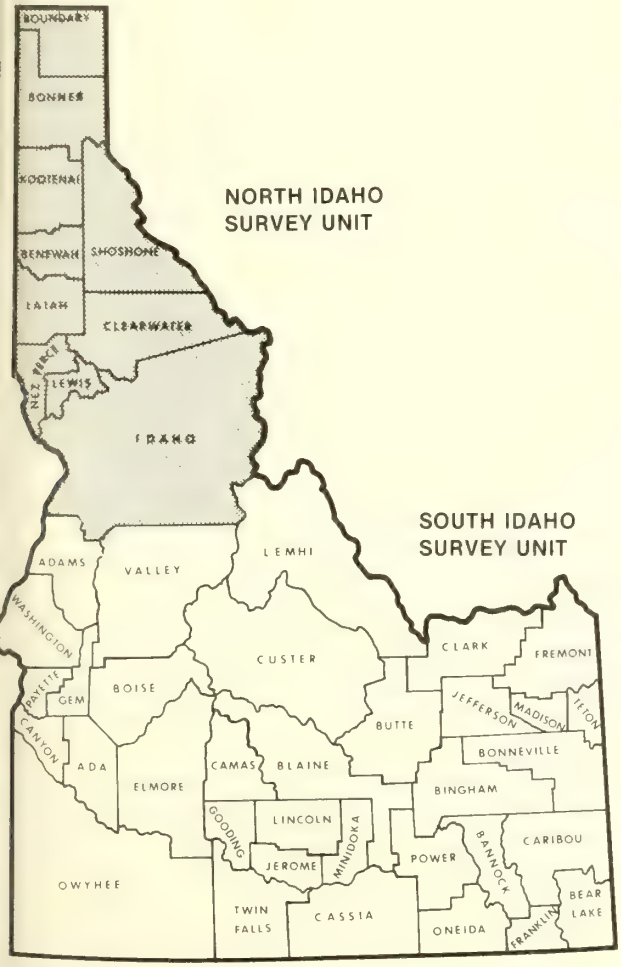


Figure 1.—Idaho counties and survey units.

Figure 2.—Marketing zones in Idaho (source: Idaho Forest Products Marketing Bulletin).

of the renewable resource situation for forest and rangelands of the Nation. Fundamental to the accomplishment of this objective are the periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

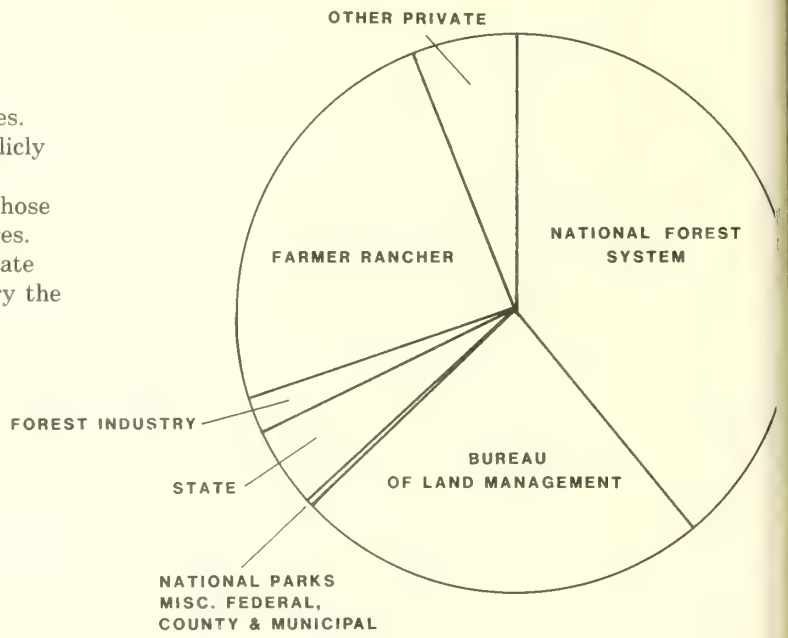
The Intermountain Research Station with headquarters in Ogden, UT, administers the forest resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah Wyoming, western South Dakota, western Texas, and Oklahoma's Panhandle. These inventories provide information on the extent and condition of State and privately owned forest lands, volume of timber, and rates of timber growth, removals, and mortality. These data, when combined with similar information on Federal lands, provide a basis for forming forest policies and programs and for the orderly development and use of the resources.

HIGHLIGHTS

Area

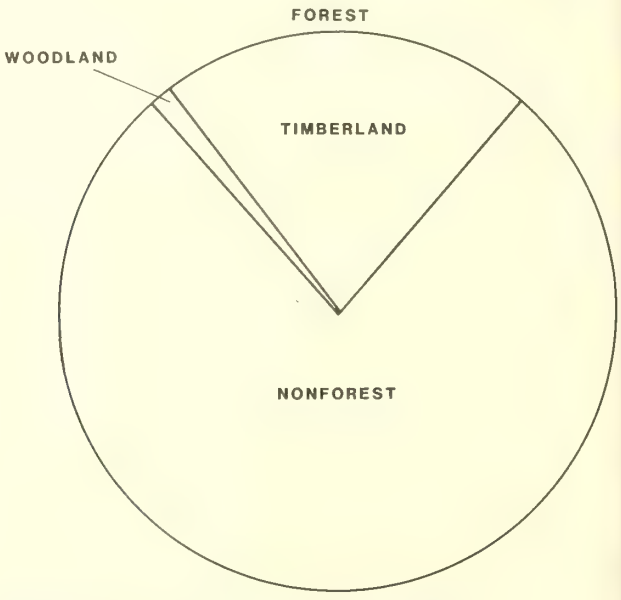
The land area of Idaho is about 52.9 million acres. Nearly 36.1 million of it (nearly 68 percent) is publicly owned.

The State of Idaho and private owners, about whose land this report is concerned, hold 19.5 million acres. The State has 2.6 million acres, nonindustrial private owners have about 15.6 million, and forest industry the other 1.3 million.

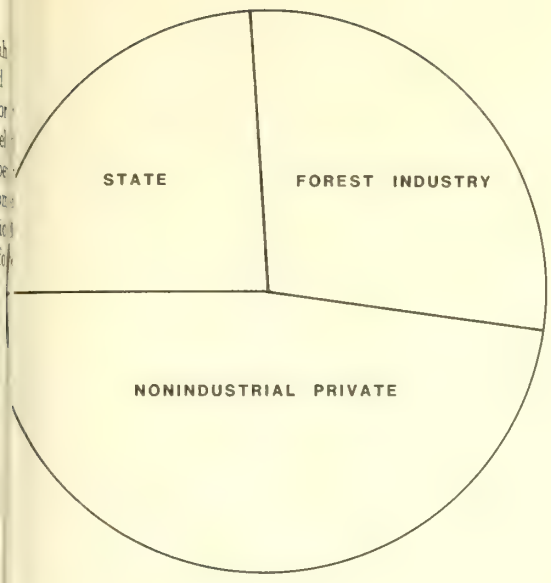


Distribution of land area in Idaho by ownership class.

Of the 19.5 million acres of State and private land, about 4.6 million is forested; 93 percent is timberland and 7 percent is classified as woodland.



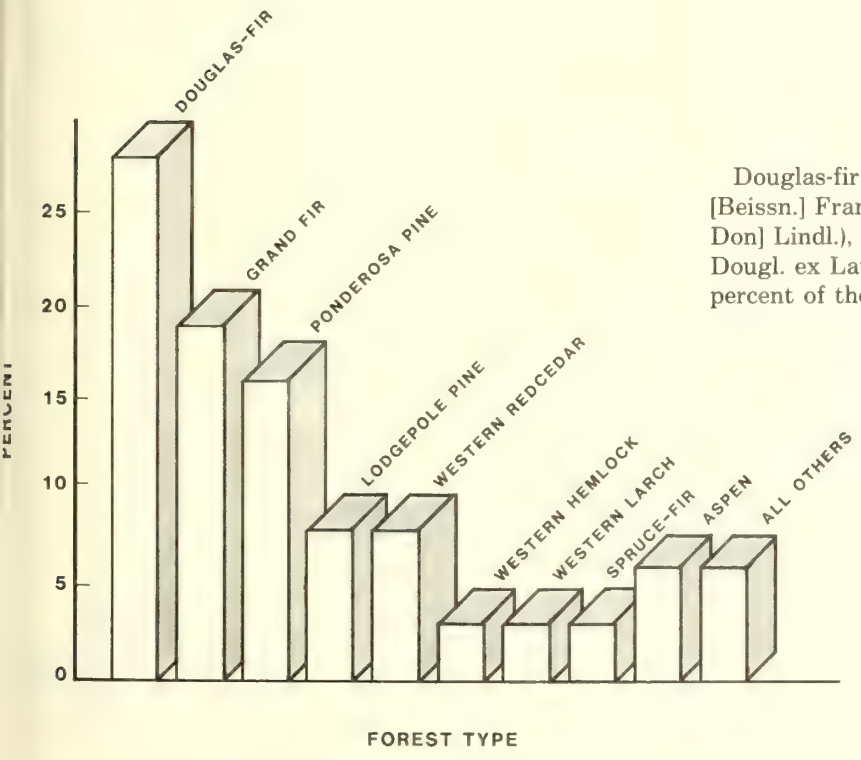
Distribution of State and private land area by type of land.



stribution of State and private
nberland by ownership class.

Timberland

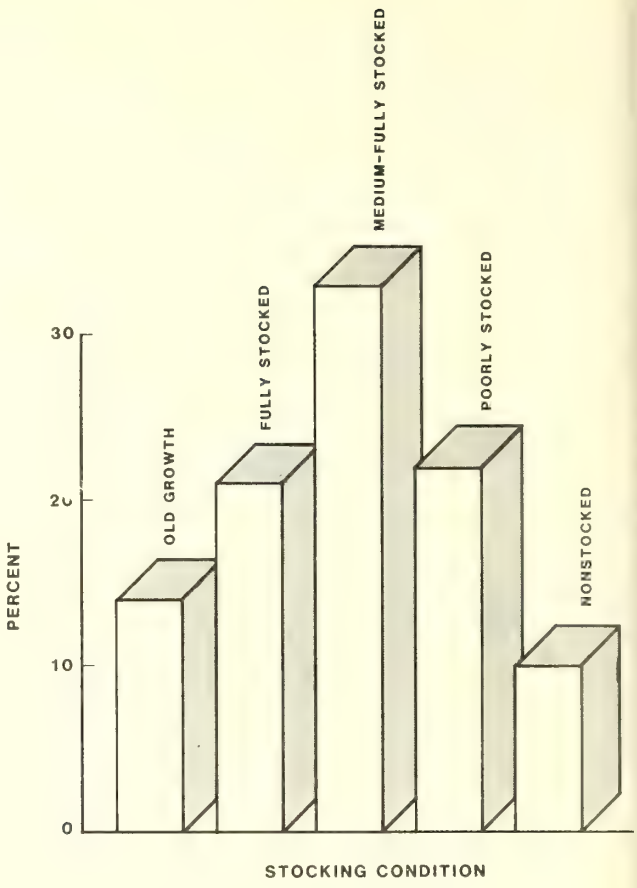
Area.—Nearly half of the timberland in State and private holdings is in nonindustrial ownership. The remainder is roughly divided evenly between the State and forest industry holdings.



Distribution of State and private timberland by forest type.

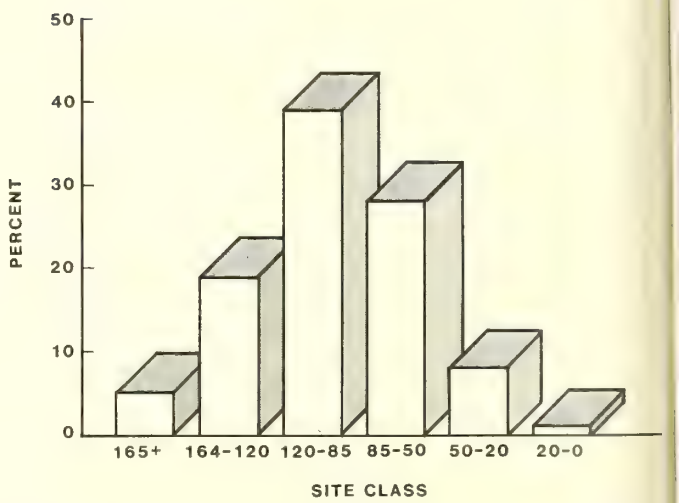
Douglas-fir (*Pseudotsuga menziesii* var. *glauca* [Beissn.] Franco), grand fir (*Abies grandis* [Dougl. ex D. Don] Lindl.), and ponderosa pine (*Pinus ponderosa* Dougl. ex Laws. var. *ponderosa*) types make up over 60 percent of the timberland area.

Roughly 14 percent of the State and private timberland is in old growth stands. Medium to fully stocked stands occupy more than half of the timberland acres. About 10 percent of the timberland area is nonstocked. And about 70 percent of the nonstocked area is in the Douglas-fir and ponderosa pine types.

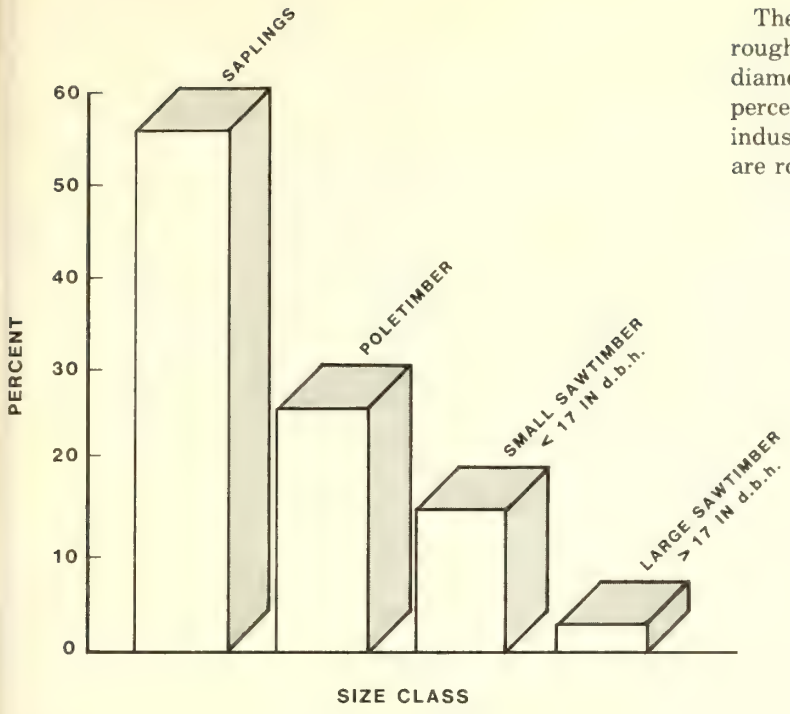


Distribution of State and private timberland by stocking class.

Idaho's timberland is among the most productive in the Western United States. Nearly two-thirds of the timbered acres have the potential to produce more than 85 cubic feet per acre per year and about a fourth could potentially produce 120 cubic feet per acre per year or more.

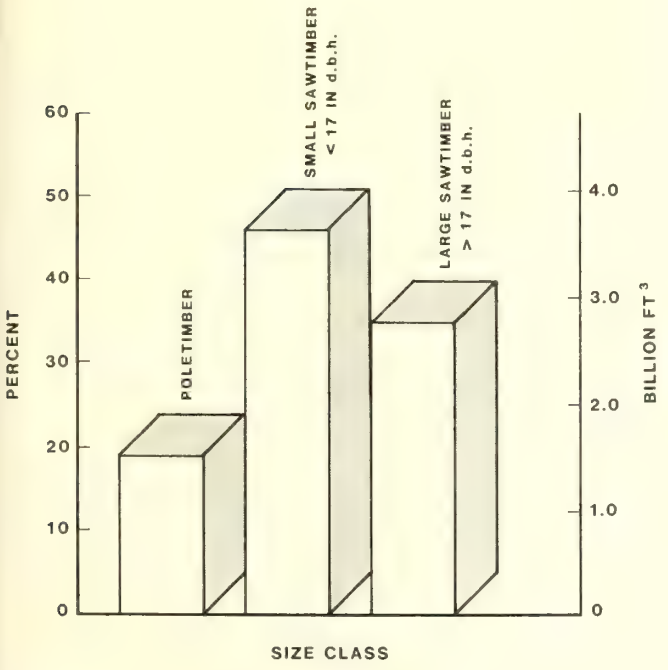


Distribution of State and private timberland by site class.



Distribution of trees on State and private timberland by tree size class.

There are an estimated 1.3 billion growing stock trees; roughly 96 percent of them are less than 17 inches diameter at breast height (d.b.h.). Of the dead trees, 73 percent are salvable, and over half of these are on non-industrial private land. About two-thirds of the cull trees are rotten.



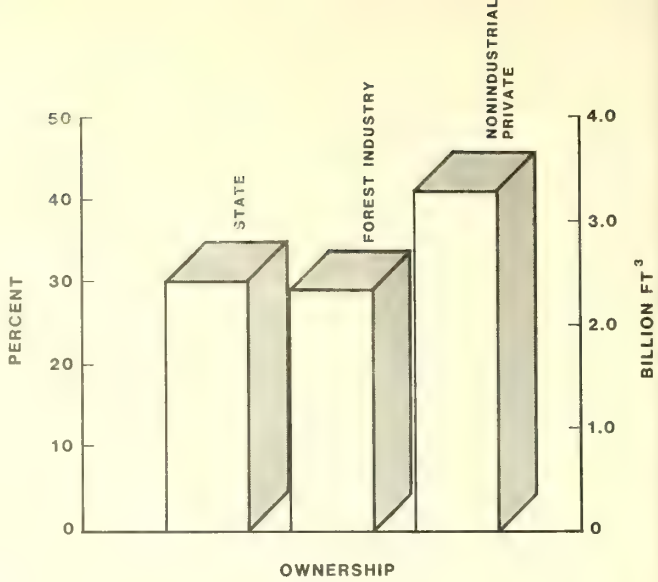
Distribution of growing stock volume on State and private timberland by tree size class.

Volume.—Growing stock volume amounts to nearly 8 billion cubic feet, and sawtimber totals some 34 billion board feet. Rough, rotten, and salvable dead trees contribute an additional 453 million cubic feet.

About 86 percent of the growing stock volume is in sawtimber size stands and 10 percent in poletimber stands. The distribution by owner groups is roughly in the same proportion.

About 65 percent of the growing stock volume is in trees less than 17 inches d.b.h., and more than three-fourths of the sawtimber volume is in trees less than 21 inches d.b.h.

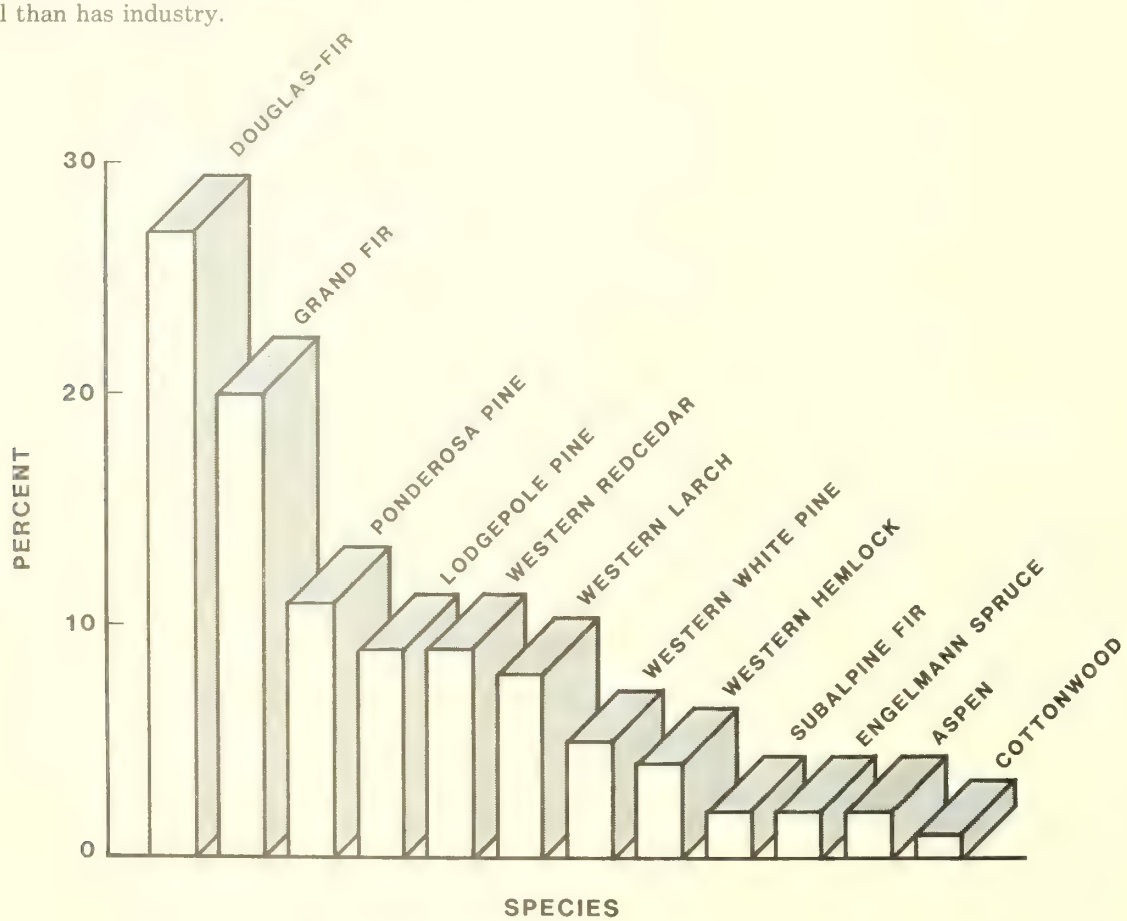
About 70 percent of the growing stock volume is on private land. Nonindustrial owners control slightly more volume than forest industry (10 percent more) but own nearly half again as much timberland.



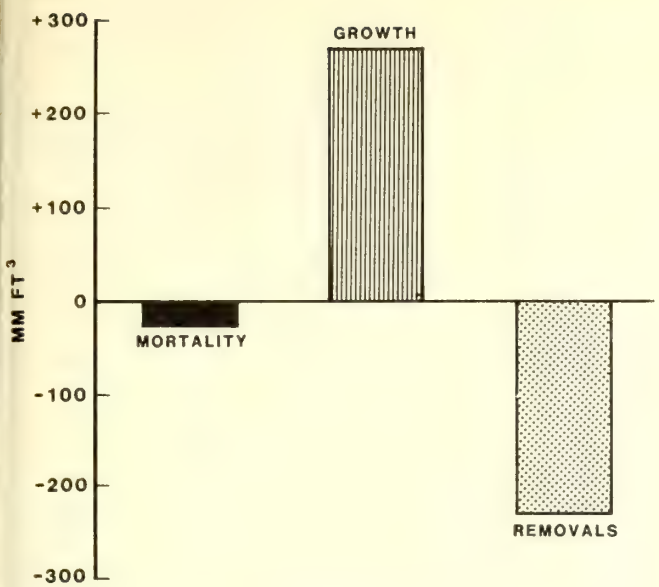
Distribution of growing stock volume on State and private timberland by ownership class.

Douglas-fir, ponderosa pine, western redcedar (*Thuja plicata* Donn ex D. Don), and lodgepole pine (*Pinus contorta* Dougl. ex Loud.) make up about 60 percent of the growing stock volume, roughly the same proportion as timberland area occupied by those types. Nonindustrial private lands support over half the Douglas-fir, ponderosa pine, and lodgepole pine growing stock volume.

Nonindustrial owners have about 40 percent of the sawtimber volume. The State has about 5 percent more of the total than has industry.



Distribution of growing stock volume on State and private timberland by species.

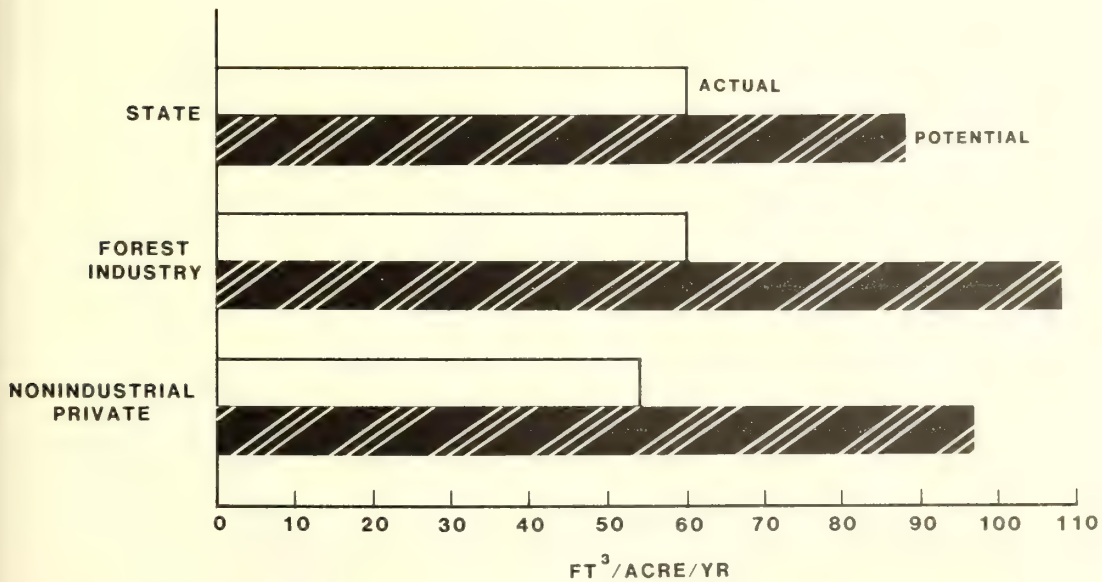


Components of change on State and private timberland.

Components of Change.—On an annual basis, gross growth of growing stock is increasing the standing volume about 3.4 percent or slightly more than one-quarter million cubic feet. Mortality, however, reduces this increment by 28 million cubic feet (108 million board feet of sawtimber), while removals from growing stock amount to 227 million cubic feet.

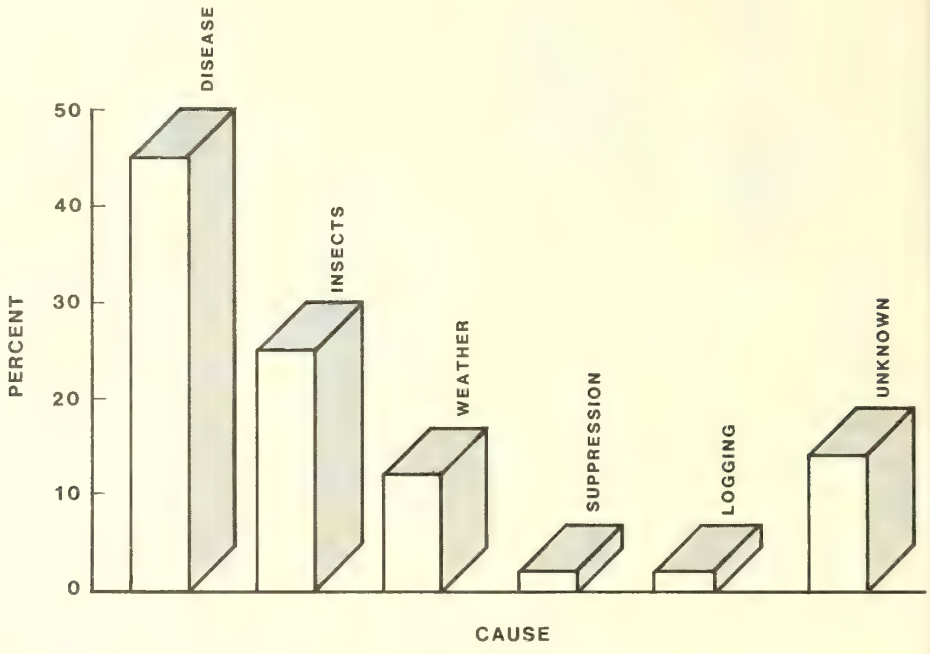
Thus, the inventory is increasing a mere 16 million cubic feet per year or 0.2 percent.

The current net annual growth per acre is 57 cubic feet, slightly more than half of the potential of 98 cubic feet per acre. The highest potential growth per acre is on forest industry lands and equals 108 cubic feet per acre per year. Acres managed by the State of Idaho are achieving nearly 70 percent of their potential net annual growth.



Actual vs. potential growth on State and private timberland by ownership class.

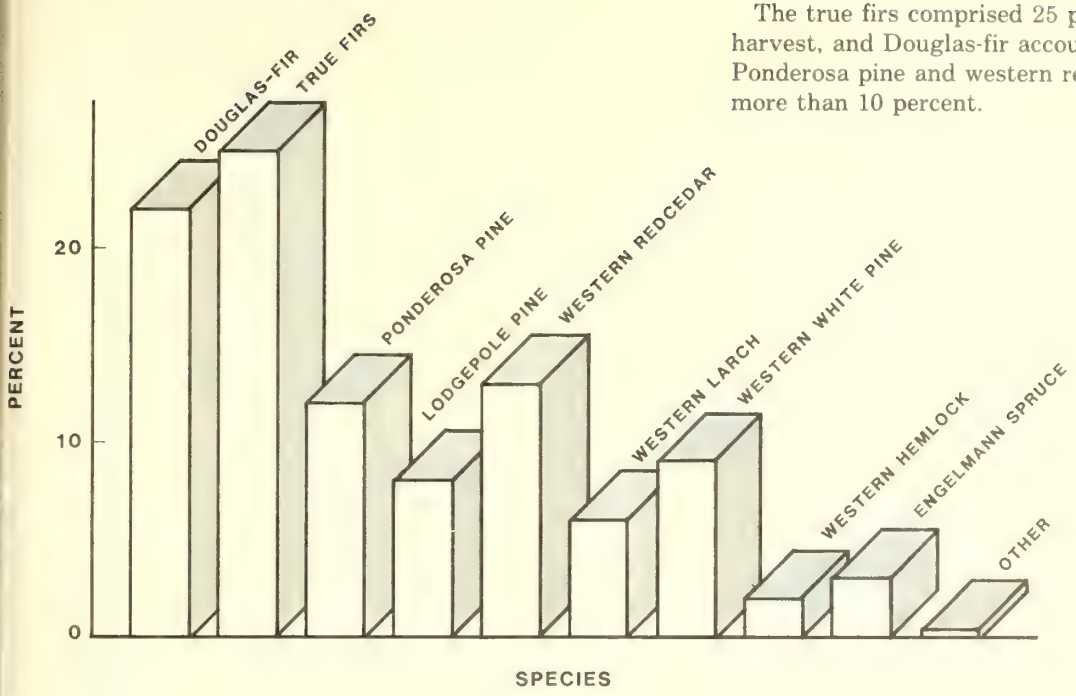
Disease was the major cause of mortality accounting for 45 percent of all dead trees. Another 25 percent succumbed to insect attacks.



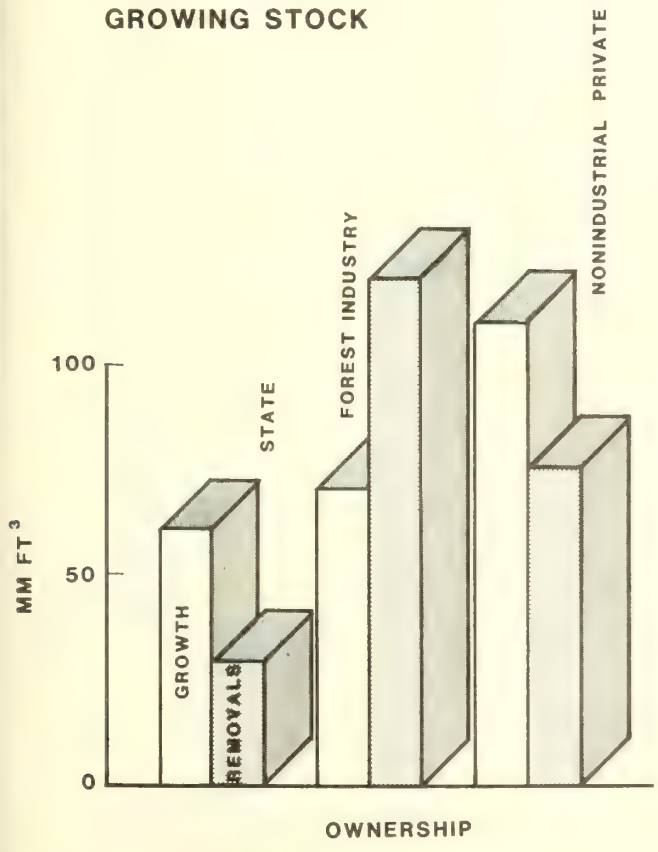
Distribution of mortality from growing stock on State and private timberland by cause.

The removal of 227 million cubic feet of growing stock and 1,307 million board feet of sawtimber represents 3 percent of the growing stock inventory and nearly 4 percent of the sawtimber inventory. Nearly 90 percent of total removals went to industrial roundwood products. Sawlogs were the major product accounting for more than 60 percent of the harvest. Pulpwood and veneer logs combined for more than a third of the harvest.

The true firs comprised 25 percent of the roundwood harvest, and Douglas-fir accounted for nearly 25 percent. Ponderosa pine and western redcedar each contributed more than 10 percent.



Distribution of removals from growing stock on State and private timberland by species.

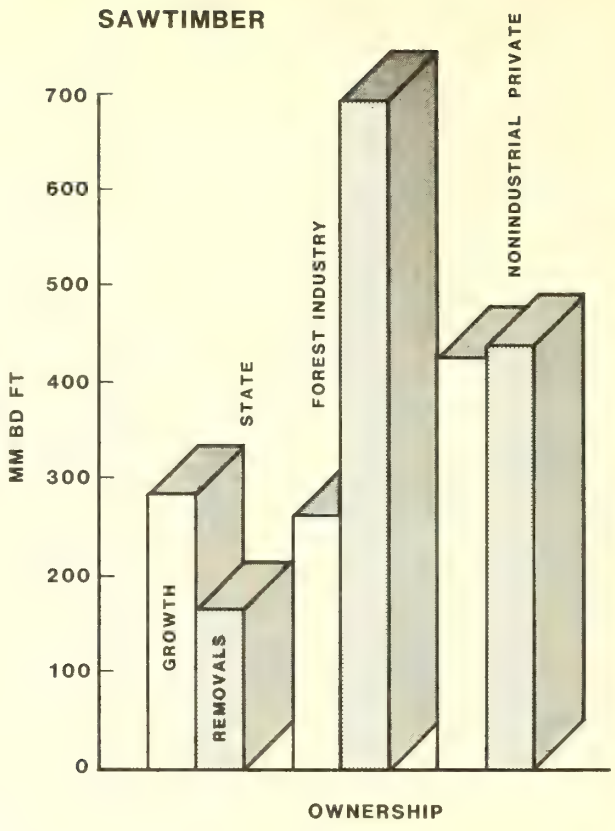


Net annual growth and annual removals from growing stock on State and private timberland by ownership class.

The growth/removals ratio for growing stock is 1.07, indicating an increasing inventory. The ratio for sawtimber is 0.75, meaning a declining inventory.

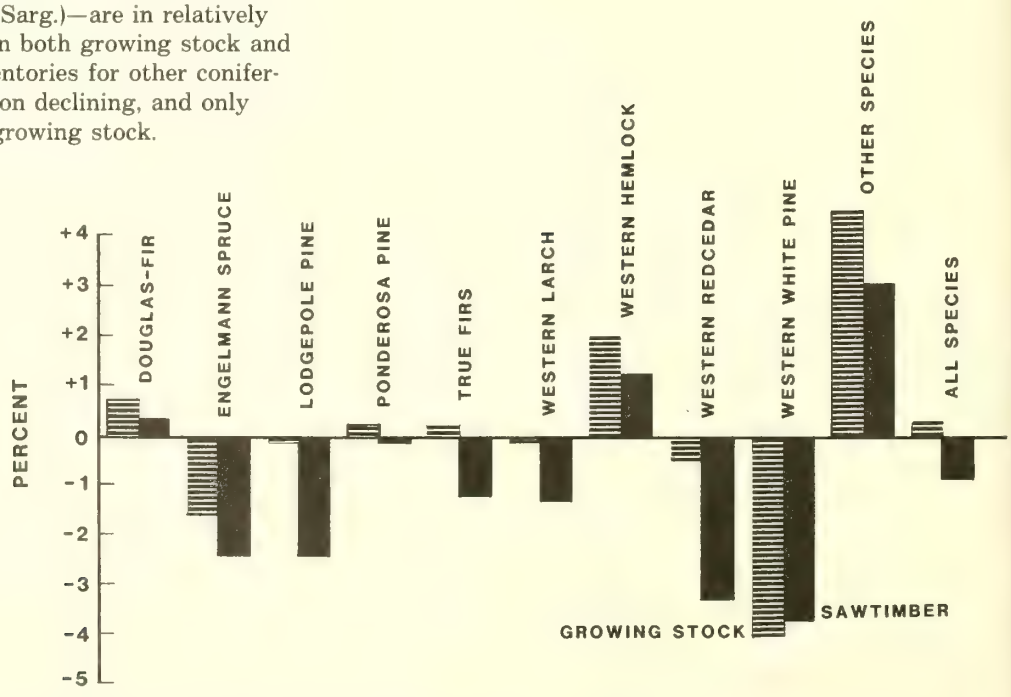
The growth/removals ratio by ownership indicates that State and nonindustrial private holdings are increasing while forest industry lands are being harvested at a rate nearly twice their growth.

The sawtimber inventories are growing faster than they are being harvested on State-managed lands only. The forest industry and nonindustrial private acres are in a declining condition.



Net annual growth and annual removals from sawtimber on State and private timberland by ownership class.

Two coniferous species—Douglas-fir and western hemlock (*Tsuga heterophylla* [Raf.] Sarg.)—are in relatively good condition showing gains in both growing stock and sawtimber. The sawtimber inventories for other coniferous species are without exception declining, and only two show a positive return to growing stock.

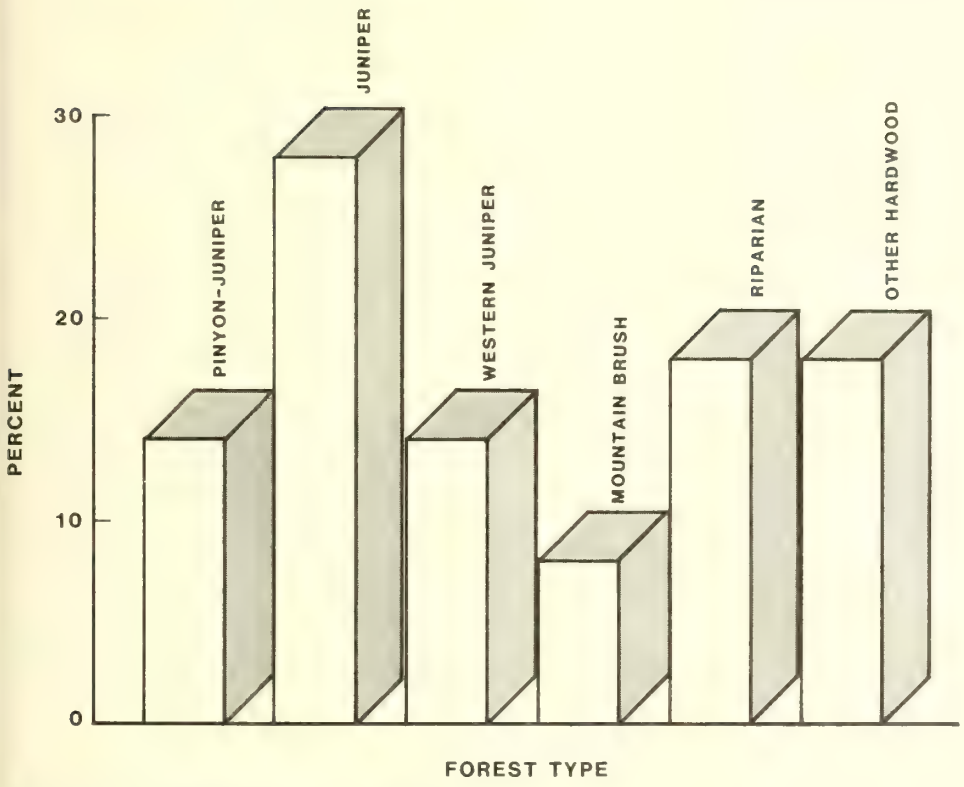


Change in growing stock and sawtimber inventory on State and private timberland by species.

Woodlands

Woodland accounts for 7 percent of the State and privately owned forested area. These acres are concentrated south of the Salmon River. Nearly 80 percent of the woodland acres is in nonindustrial private ownership. An additional 18 percent is administered by the State.

More than half of these acres are dominated by juniper, either Rocky Mountain (*Juniperus scopulorum* Sarg.), Utah (*J. osteosperma* [Torr.] Little), or western (*J. occidentalis* Hook.).



Distribution of State and private woodland by forest type.

Net volume on woodland amounted to 134 million cubic feet of which 3 percent is in timberland species.

Woodland areas are growing at an annual rate of 3,044 thousand cubic feet, or 9.6 cubic feet per acre. Mortality amounted to 104 thousand cubic feet or 3.4 percent of the annual growth.

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics primarily at the State and working circle levels.

Prefield

Initial area estimates were based on the classification of 216,482 sample points systematically placed on the latest aerial photographs available. The sample points were summarized and grouped into strata for subsequent field sampling. The photo points, adjusted to meet known land areas, were used to compute area expansion factors for the sampling strata means.

Field

Land classification and estimates for timber characteristics and volume were based on observations and measurements recorded at 2,826 ground sample locations, of which 550 were forested. Sample trees were selected using a 5-point cluster, which includes 1/300-acre fixed radius plots for trees less than 5 inches d.b.h., and 40 basal area factor variable radius plots for trees 5 inches d.b.h. or larger.

Compilation

All photo and field data were loaded onto tape and stored for computer editing, computation, and tabulation. Final estimates from these data were based on statistical summaries, a portion of which are included in this bulletin.

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on very small sample sizes, which may result in high sampling errors. The standard error percentages shown in tables 1 and 2 were calculated at the 67 percent confidence level.

TERMINOLOGY

The following section contains definitions that are relevant to the timber resource data presented in this resource bulletin.

Land

Area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains; streams, sloughs, estuaries, and canals less than 120 feet in width; and lakes, reservoirs, and ponds less than 1 acre in size.

Water

Streams, sloughs, estuaries, and canals more than 120 feet in width; and lakes, reservoirs, and ponds more than 1 acre in size.

Land Use Classes

Forest Land.—Land at least 10 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use.

Timberland.—Forest land at least 10 percent stocked with timber species that are producing or capable of producing crops of industrial wood and not reserved. Currently areas that may be inaccessible or inoperable are included.

Reserved Forest Land.—Forest land withdrawn from timber utilization through statute or administrative designation.

Woodland.—Forest land less than 10 percent stocked with timber species and not reserved.

Nonforest Land.—Land that has never supported forests, and lands formerly forested where use for timber management is precluded by development for other uses.

Public Ownership Classes

National Forest Lands.—Federal lands legally designated as National Forest or purchase units and other lands under the administration of the Forest Service, including experimental areas and Bankhead-Jones Title III lands.

Bureau of Land Management Lands.—Federal lands administered by the Bureau of Land Management.

Miscellaneous Federal Lands.—Federal lands other than (1) National Forest lands and (2) lands administered by the Bureau of Land Management.

State Lands.—Lands owned by States or lands leased to these governmental units for 50 years or more.

County and Municipal Lands.—Lands owned by counties and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

Private Ownership Classes

Forest Industry Lands.—Lands owned by companies or by individuals operating wood-processing plants.

Farmer-Owned Lands.—Lands owned by farm operators. These exclude lands leased by farm operators from such nonfarm owners as railroad companies and States.

Other Private Lands.—Privately owned lands other than forest industry and farmer-owned lands.

Forest Type and Tree Species

Forest Types.—A classification of forest land based upon the species forming a plurality of live-tree stocking.

Forest Trees.—Woody plants having a well-developed stem or stems, usually more than 12 feet in height at maturity, with a more or less well defined crown.

Timber Species.—Forest tree species presently or prospectively suitable for industrial wood products.

Woodland Species.—Forest tree species not usually converted into conventional industrial wood products.

Softwoods.—Monocotyledonous trees, usually evergreen having needles or scalelike leaves.

Hardwoods.—Dicotyledonous trees, usually broadleaved and deciduous.

Area Condition Classes

Stocking.—Stocking is an expression of the extent to which growing space is effectively utilized by present or potential growing stock trees of timber species. "Percent of stocking" is synonymous with "percentage of growing space occupied" and means the ratio of actual stocking to full stocking for comparable sites and stands. Basal area is used as a basis for measuring stocking.

"Stocking percentages" express current area occupancy in relation to specified standards for full stocking based on number, size, and spacing of trees considered necessary to fully utilize the forest land.

Full utilization of the site is assumed to occur over a range of basal area. As an interim guide, 60 percent of normal yield table values has been used to establish the lower limit of this range, which represents full-site occupancy, and equals 60 percent stocking. The upper limit of full stocking has been set at 80 percent.

Class 10.—Areas fully stocked (60 to 80 percent) with desirable trees and not overstocked (80 percent or more).

Class 20.—Areas fully stocked with desirable trees, but overstocked with all live trees.

Class 30.—Areas medium to fully stocked (35 to 60 percent) with desirable trees and with less than 20 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Class 40.—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees, or conditions that ordinarily prevent occupancy by desirable trees, or both.

Class 50.—Areas poorly stocked (10 to 35 percent) with desirable trees, but fully stocked with growing stock trees.

Class 60.—Areas poorly stocked with desirable trees, but with medium to full stocking of growing stock trees.

Class 70.—Areas nonstocked (less than 10 percent) or poorly stocked with desirable trees, and poorly stocked with growing stock trees.

Class 80.—Low-risk old-growth stands.

Class 90.—High-risk old-growth stands.

Nonstocked.—Areas less than 10 percent stocked with growing stock trees.

Productivity

Productivity Class.—A classification of forest land in terms of potential growth in cubic feet of fully stocked natural stands.

Stand-Size Classes

Sawtimber Stands.—Stands at least 10 percent stocked with growing stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber Stands.—Stands at least 10 percent stocked with growing stock trees in which half or more of this stocking is in poletimber or sawtimber trees, or both, and with poletimber stocking exceeding that of sawtimber.

Sapling-Seedling Stands.—Stands at least 10 percent stocked with growing stock trees in which more than half of the stocking is saplings, seedlings, or both.

Nonstocked Land.—Timberland that is less than 10 percent stocked with growing stock trees.

Class of Timber

Growing Stock Trees.—Live trees of timber species qualifying as desirable or acceptable trees. (Excludes rough, rotten, and dead trees of timber species and woodland species.)

Desirable Trees.—Growing stock trees (1) having no serious defect in quality to limit present or prospective use for timber products, (2) of relatively high vigor, and (3) containing no pathogens that may result in death or serious deterioration before rotation age.

Acceptable Trees.—Growing stock trees meeting specified standards of size and quality, but not qualifying as desirable trees.

Rough Trees.—Live trees that are timber species that do not contain at least one 12-foot sawlog or two noncontiguous sawlogs, each 8 feet or longer, now or prospectively, and/or do not meet Rocky Mountain regional specifications for freedom from defect primarily because of roughness or poor form.

Rotten Trees.—Live trees that are timber species that do not contain at least one 12-foot sawlog or two noncontiguous sawlogs, each 8 feet or longer, now or prospectively, and/or do not meet Rocky Mountain regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume (cubic-foot basis) in a tree is rotten.

Salvable Dead Trees.—Standing or down dead trees that are considered merchantable by Rocky Mountain regional standards.

Sawlog Portion.—That part of the bole of sawtimber trees between the stump and the sawlog top. A 1-foot stump is used.

Upper-Stem Portion.—That part of the bole of sawtimber trees above the sawlog top to a minimum top diameter of 4 inches outside bark or to the point where the central stem breaks into limbs, whichever occurs first.

Tree-Size Classes

Seedlings.—Live trees less than 1 inch d.b.h.

Saplings.—Trees 1 to 4.9 inches d.b.h.

Poletimber Trees.—Trees that are timber species at least 5 inches d.b.h., but smaller than sawtimber size.

Sawtimber Trees.—Trees that are timber species and exceed poletimber size. In the Intermountain States, the minimum d.b.h. for softwood sawtimber is 9 inches and for hardwoods 11 inches.

Volume

Cull Volume.—Portions of a tree's volume that are not usable for industrial wood products because of rot, form, or other defect.

Net Volume.—Gross volume less deductions for cull.

Growing Stock Volume.—Net volume in cubic feet of live sawtimber trees and live poletimber trees from

stump to a minimum 4-inch top (of central stem) outside bark. Net volume equals gross volume less deduction for rot and missing bole sections.

Sawtimber Volume.—Net volume in board feet of sawtimber trees of timber species. Net volume equals gross volume less deduction for rot, sweep, crook, and other defects that affect use for lumber.

Components of Change

Net Annual Growth.—The increase in net growing stock or sawtimber volume of a specified size class for a specific year. Components of net annual growth include the increment in net volume of trees at the beginning of the specific year surviving to its end, plus the net volume of trees reaching the size class during the year, minus the net volume of trees that died during the year, minus the net volume of trees that became rough or rotten trees during the year.

Mortality.—Number or sound-wood volume of growing stock trees dying from natural causes during a specified period, usually annually.

Removals.—The net volume of growing stock or sawtimber trees removed from the inventory by harvesting, including the unused portions of growing stock or sawtimber trees cut or killed by logging, and cultural operations such as timber stand improvement, land clearings, and changes in land use.

Table 1.--Area of State and privately owned forest land in Idaho with percent standard error, 1981

Item	Softwoods		Hardwoods		All types	
	Acres	Percent standard error	Acres	Percent standard error	Acres	Percent standard error
Timberland	3,936,793	±1.0	311,321	± 9.5	4,248,114	±1.0
Woodland	176,076	±5.8	140,302	±17.3	316,378	±7.4
Reserved forest land:[1]						
Timberland	--		--		--	
Woodland	--		--		--	
Total forest land	4,112,869		451,623		4,564,492	

[1]Reserved land areas are estimated from aerial photos without field verification; therefore, standard errors are not calculated.

Table 2.--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on State and privately owned timberland in Idaho with percent standard error

Item	Softwoods		Hardwoods		All species	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume, 1981:						
Growing stock (M cubic feet)	7,670,468	±2.8	292,077	±11.7	7,962,545	±2.7
Sawtimber[1] (M board feet)	33,811,844	±3.0	632,031	±18.7	34,443,875	±2.9
Sawtimber[2] (M board feet)	28,602,782	±3.0	545,003	±18.9	29,147,785	±3.0
Net annual growth, 1980:						
Growing stock (M cubic feet)	229,676	±4.0	13,588	±17.0	243,264	±3.9
Sawtimber[1] (M board feet)	958,279	±3.8	23,036	±24.7	981,315	±3.8
Sawtimber[2] (M board feet)	857,085	±3.7	19,675	±23.5	876,760	±3.7
Annual mortality, 1980:						
Growing stock (M cubic feet)	25,572	±12.3	2,285	±39.8	27,857	±11.7
Sawtimber[1] (M board feet)	104,293	±12.7	3,635	±75.4	107,928	±12.5
Sawtimber[2] (M board feet)	88,456	±12.7	3,142	±75.2	91,598	±12.5

[1]International ¼-inch rule.

[2]Scribner rule.

Table 3.--Total land and water area in Idaho by ownership class, 1981

Ownership class	Area
	- - - Acres - - -
Land:	
National Forest	20,422,830
Bureau of Land Management	12,620,859
National Park Service	87,142
Miscellaneous Federal lands	166,547
County and municipal	120,629
State	2,649,073
Private:	
Forest industry[1]	1,271,940
Nonindustrial private:	
Farmer-rancher	12,605,283
Other	2,946,773
Total nonindustrial private	15,552,056
Total private	16,823,996
Total land area	52,891,076
Census water	590,159
Total land and water[2]	53,481,235

[1]Forest industry is a component of private ownership, but because of its importance to the Idaho timber supply situation, area and resource statistics are shown separately in this and other tables dealing with owner groups in this report.

[2]U.S. Bureau of the Census, land and water area of the United States, 1980.

Table 4.--Total land area in State and private ownership in Idaho by major land class and ownership class, 1981

Land class	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	- - - - - - - - - - - - Acres - - - - - - - - - - - -			
Timberland	1,029,980	1,178,147	2,039,987	4,248,114
Woodland	57,826	10,180	248,372	316,378
Total	1,087,806	1,188,327	2,288,359	4,564,492
Nonforest land	1,561,267	83,613	13,263,697	14,908,577
Total land area	2,649,073	1,271,940	15,552,056	19,473,069

Table 5.--Cubic feet of net volume in trees on State and privately owned forest land in Idaho by species and ownership class, 1981

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	- - - - - - - - Thousand cubic feet - - - - - - - -			
Douglas-fir	562,044	467,252	1,147,980	2,177,276
Ponderosa pine	194,811	142,582	501,045	838,438
Western white pine	217,045	67,373	116,349	400,767
Lodgepole pine	164,118	136,458	386,058	686,634
Limber pine	377	--	4,003	4,380
Western larch	175,713	191,240	231,678	598,631
Grand fir	504,146	665,841	400,612	1,570,599
Subalpine fir	58,735	62,436	39,900	161,071
Engelmann spruce	83,893	72,281	28,552	184,726
Western hemlock	106,633	129,446	59,623	295,702
Western redcedar	262,305	332,032	161,556	755,893
Aspen	61,621	4,151	121,742	187,514
Cottonwood	6,063	13,385	85,753	105,201
Total timberland species	2,397,504	2,284,477	3,284,851	7,966,832
Pinyon-juniper	31,235	30	71,886	103,151
Woodland hardwoods	8,583	11,401	60,780	80,764
Total woodland species	39,818	11,431	132,666	183,915
Total all species	2,437,322	2,295,908	3,417,517	8,150,747

Table 6.--Cubic feet of net annual growth in trees on State and privately owned forest land in Idaho by species and ownership class, 1980

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	- - - - - - - Thousand cubic feet - - - - - - -			
Douglas-fir	15,208	12,997	37,263	65,468
Ponderosa pine	5,600	3,929	18,419	27,948
Western white pine	2,244	-651	2,966	4,559
Lodgepole pine	4,376	3,050	10,652	18,078
Limber pine	7	--	50	57
Western larch	4,652	2,714	5,637	13,003
Grand fir	13,982	24,027	14,988	52,997
Subalpine fir	1,878	3,232	2,918	8,028
Engelmann spruce	1,463	1,998	523	3,984
Western hemlock	3,047	4,373	1,838	9,258
Western redcedar	5,783	14,636	5,997	26,416
Aspen	3,022	206	7,577	10,805
Cottonwood	180	396	2,232	2,808
Total timberland species	61,442	70,907	111,060	243,409
Pinyon-juniper	649	2	1,222	1,873
Woodland hardwoods	127	214	1,658	1,999
Total woodland species	776	216	2,880	3,872
Total all species	62,218	71,123	113,940	247,281

Table 7.--Cubic feet of annual mortality in trees on State and privately owned forest land in Idaho by species and ownership class, 1980

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	- - - - - - Thousand cubic feet - - - - - -			
Douglas-fir	613	1,490	3,089	5,192
Ponderosa pine	219	1,336	1,485	3,040
Western white pine	2,072	1,796	1,014	4,882
Lodgepole pine	366	561	851	1,778
Limber pine	--	--	--	--
Western larch	234	961	1,312	2,507
Grand fir	489	2,592	2,994	6,075
Subalpine fir	138	--	481	619
Engelmann spruce	147	--	--	147
Western hemlock	32	214	277	523
Western redcedar	24	632	153	809
Aspen	89	1	1,468	1,558
Cottonwood	14	--	713	727
Total timberland species	4,437	9,583	13,837	27,857
Pinyon-juniper	77	--	--	77
Woodland hardwoods	1	71	54	126
Total woodland species	78	71	54	203
Total all species	4,515	9,654	13,891	28,060

Table 8.--Area of State and privately owned timberland in Idaho by forest type, stand-size class, and productivity class, 1981

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	Acres						
Douglas-fir:							
Sawtimber	70,053	227,730	353,522	153,891	8,444	--	813,640
Poletimber	13,947	9,332	30,965	38,447	3,935	--	96,626
Sapling and seedling	5,201	17,158	51,835	39,706	824	--	114,724
Nonstocked	227	3,240	22,275	54,699	66,095	7,314	153,850
Total	89,428	257,460	458,597	286,743	79,298	7,314	1,178,840
Western hemlock:							
Sawtimber	828	29,870	47,566	34,088	587	--	112,939
Poletimber	--	326	15,346	588	--	--	16,260
Sapling and seedling	--	628	6,929	313	398	--	8,268
Nonstocked	--	--	1,941	914	--	--	2,855
Total	828	30,824	71,782	35,903	985	--	140,322
Mountain hemlock:							
Sawtimber	--	--	--	219	--	--	219
Poletimber	--	--	--	138	--	--	138
Sapling and seedling	--	--	337	--	--	--	337
Nonstocked	--	--	585	1,112	--	--	1,697
Total	--	--	922	1,469	--	--	2,391
Ponderosa pine:							
Sawtimber	15,641	86,051	193,952	139,723	10,126	--	445,493
Poletimber	4,855	248	8,722	28,921	4,955	--	47,701
Sapling and seedling	--	12,180	14,067	22,781	295	--	49,323
Nonstocked	--	1,212	60,088	60,116	29,546	--	150,962
Total	20,496	99,691	276,829	251,541	44,922	--	693,479
Western white pine:							
Sawtimber	18,984	29,904	23,884	3,654	740	--	77,166
Poletimber	2,741	5,919	1,970	295	--	--	10,925
Sapling and seedling	456	897	1,367	1,613	--	--	4,333
Nonstocked	--	5,525	1,576	2,313	1,636	--	11,050
Total	22,181	42,245	28,797	7,875	2,376	--	103,474
Lodgepole pine:							
Sawtimber	13,578	9,912	74,208	57,782	15,043	--	170,523
Poletimber	15,004	6,884	23,961	37,721	7,024	--	90,594
Sapling and seedling	76	--	12,316	34,177	2,537	--	49,106
Nonstocked	--	377	11,115	13,419	1,257	--	26,168
Total	28,658	17,173	121,600	143,099	25,861	--	336,391
Western larch:							
Sawtimber	248	22,558	39,412	17,228	--	--	79,446
Poletimber	1,199	13,397	15,345	3,488	--	--	33,429
Sapling and seedling	481	--	2,011	305	--	--	2,797
Nonstocked	--	--	--	--	--	--	--
Total	1,928	35,955	56,768	21,021	--	--	115,672

(con.)

Table 8. (con.)

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	Acres						
Western redcedar:							
Sawtimber	34,554	47,497	118,942	36,230	2,009	--	239,232
Poletimber	326	6,542	8,777	2,737	--	--	18,382
Sapling and seedling	--	39,141	17,925	18,100	--	--	75,166
Nonstocked	--	5,229	9,281	4,007	2,212	--	20,729
Total	34,880	98,409	154,925	61,074	4,221	--	353,509
Grand fir:							
Sawtimber	28,716	180,449	303,608	133,125	864	--	646,762
Poletimber	4,875	1,082	12,277	9,504	377	--	28,115
Sapling and seedling	326	398	54,532	44,586	--	--	99,842
Nonstocked	--	14,553	6,840	8,942	1,822	--	32,157
Total	33,917	196,482	377,257	196,157	3,063	--	806,876
Spruce-subalpine fir:							
Sawtimber	--	8,035	47,028	37,663	2,897	--	95,623
Poletimber	--	--	7,304	11,932	1,690	--	20,926
Sapling and seedling	--	--	15,647	976	336	--	16,959
Nonstocked	--	--	--	11,612	1,258	--	12,870
Total	--	8,035	69,979	62,183	6,181	--	146,378
Spruce:							
Sawtimber	--	7,574	23,594	9,192	--	--	40,360
Poletimber	--	--	457	--	--	--	457
Sapling and seedling	--	--	5,861	11,091	--	--	16,952
Nonstocked	--	377	937	377	--	--	1,691
Total	--	7,951	30,849	20,660	--	--	59,460
Aspen:							
Sawtimber	164	--	3,341	5,622	2,835	--	11,962
Poletimber	--	--	1,479	20,038	66,011	4,908	92,436
Sapling and seedling	--	5,933	6,489	13,202	76,596	20,620	122,840
Nonstocked	--	--	--	691	635	4,908	6,234
Total	164	5,933	11,309	39,553	146,077	30,436	233,472
Cottonwood:							
Sawtimber	--	7,906	4,908	26,118	7,821	--	46,753
Poletimber	--	--	--	--	8,706	--	8,706
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	16,144	6,247	--	22,391
Total	--	7,906	4,908	42,262	22,774	--	77,850
All types:							
Sawtimber	182,766	657,486	1,233,965	654,535	51,366	--	2,780,118
Poletimber	42,947	43,730	126,603	153,809	92,698	4,908	464,695
Sapling and seedling	6,540	76,335	189,316	186,850	80,986	20,620	560,647
Nonstocked	227	30,513	114,638	174,346	110,708	12,222	442,654
Total	232,480	808,064	1,664,522	1,169,540	335,758	37,750	4,248,114

Table 9.--Area of State owned timberland in Idaho by forest type, stand-size class, and productivity class, 1981

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	Acres						
Douglas-fir:							
Sawtimber	2,156	21,070	46,401	28,049	1,685	--	99,361
Poletimber	456	4,489	6,336	5,455	3,935	--	20,671
Sapling and seedling	358	788	4,683	8,697	824	--	15,350
Nonstocked	227	--	9,140	9,038	61,252	556	80,213
Total	3,197	26,347	66,560	51,239	67,696	556	215,595
Western hemlock:							
Sawtimber	828	9,695	19,262	10,189	587	--	40,561
Poletimber	--	326	1,141	588	--	--	2,055
Sapling and seedling	--	628	630	313	398	--	1,969
Nonstocked	--	--	1,941	914	--	--	2,855
Total	828	10,649	22,974	12,004	985	--	47,440
Mountain hemlock:							
Sawtimber	--	--	--	219	--	--	219
Poletimber	--	--	--	138	--	--	138
Sapling and seedling	--	--	337	--	--	--	337
Nonstocked	--	--	585	1,112	--	--	1,697
Total	--	--	922	1,469	--	--	2,391
Ponderosa pine:							
Sawtimber	2,892	9,412	28,866	46,226	10,126	--	97,522
Poletimber	126	248	1,963	9,812	4,955	--	17,104
Sapling and seedling	--	207	1,613	4,838	295	--	6,953
Nonstocked	--	1,212	19,277	18,578	11,390	--	50,457
Total	3,018	11,079	51,719	79,454	26,766	--	172,036
Western white pine:							
Sawtimber	5,097	29,904	23,884	3,654	740	--	63,279
Poletimber	2,741	1,076	1,970	295	--	--	6,082
Sapling and seedling	456	897	1,367	1,613	--	--	4,333
Nonstocked	--	296	1,576	2,313	1,636	--	5,821
Total	8,294	32,173	28,797	7,875	2,376	--	79,515
Lodgepole pine:							
Sawtimber	2,437	3,613	12,057	22,457	10,200	--	50,764
Poletimber	1,117	342	2,891	8,693	7,024	--	20,067
Sapling and seedling	76	--	2,630	3,064	2,537	--	8,307
Nonstocked	--	377	5,227	3,037	1,257	--	9,898
Total	3,630	4,332	22,805	37,251	21,018	--	89,036
Western larch:							
Sawtimber	248	2,260	10,284	4,949	--	--	17,741
Poletimber	1,199	4,353	4,204	3,488	--	--	13,244
Sapling and seedling	481	--	2,011	305	--	--	2,797
Nonstocked	--	--	--	--	--	--	--
Total	1,928	6,613	16,499	8,742	--	--	33,782

(con.)

Table 9. (con.)

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - - - - - Acres - - - - - - - - - - - - - - - -						
Western redcedar:							
Sawtimber	5,334	17,665	27,681	18,377	2,009	--	71,066
Poletimber	326	--	1,987	2,737	--	--	5,050
Sapling and seedling	--	32	4,028	3,651	--	--	7,711
Nonstocked	--	--	4,052	4,007	2,212	--	10,271
Total	5,660	17,697	37,748	28,772	4,221	--	94,098
Grand fir:							
Sawtimber	3,689	25,184	66,682	54,523	864	--	150,942
Poletimber	32	1,082	2,592	2,962	377	--	7,045
Sapling and seedling	326	398	1,055	2,105	--	--	3,884
Nonstocked	--	713	6,840	8,942	1,822	--	18,317
Total	4,047	27,377	77,169	68,532	3,063	--	180,188
Spruce-subalpine fir:							
Sawtimber	--	2,174	15,279	13,621	2,897	--	33,971
Poletimber	--	--	355	2,333	1,690	--	4,378
Sapling and seedling	--	--	1,879	976	336	--	3,191
Nonstocked	--	--	--	2,013	1,258	--	3,271
Total	--	2,174	17,513	18,943	6,181	--	44,811
Spruce:							
Sawtimber	--	3,211	4,242	2,433	--	--	9,886
Poletimber	--	--	457	--	--	--	457
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	377	937	377	--	--	1,691
Total	--	3,588	5,636	2,810	--	--	12,034
Aspen:							
Sawtimber	164	--	3,341	5,622	2,835	--	11,962
Poletimber	--	--	1,479	5,537	17,260	74	24,350
Sapling and seedling	--	45	404	6,443	6,036	176	13,104
Nonstocked	--	--	--	691	635	74	1,400
Total	164	45	5,224	18,293	26,766	324	50,816
Cottonwood:							
Sawtimber	--	--	74	2,654	--	--	2,728
Poletimber	--	--	--	--	2,694	--	2,694
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	2,654	162	--	2,816
Total	--	--	74	5,308	2,856	--	8,238
All types:							
Sawtimber	22,845	124,188	258,053	212,973	31,943	--	650,002
Poletimber	5,997	11,916	25,375	42,038	37,935	74	123,335
Sapling and seedling	1,697	2,995	20,637	32,005	10,426	176	67,936
Nonstocked	227	2,975	49,575	53,676	81,624	630	188,707
Total	30,766	142,074	353,640	340,692	161,928	880	1,029,980

Table 10.--Area of forest industry timberland in Idaho by forest type, stand-size class, and productivity class, 1981

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - - - - - Acres - - - - - - - - - - - - - - - -						
Douglas-fir:							
Sawtimber	13,426	90,410	45,395	32,021	--	--	181,252
Poletimber	13,491	--	747	7,941	--	--	22,179
Sapling and seedling	--	5,229	13,720	12,279	--	--	31,228
Nonstocked	--	460	7,050	8,334	--	--	15,844
Total	26,917	96,099	66,912	60,575	--	--	250,503
Western hemlock:							
Sawtimber	--	20,175	22,006	14,855	--	--	57,036
Poletimber	--	--	7,906	--	--	--	7,906
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--
Total	--	20,175	29,912	14,855	--	--	64,942
Mountain hemlock:							
Sawtimber	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--
Ponderosa pine:							
Sawtimber	7,906	1,592	33,137	19,462	--	--	62,097
Poletimber	--	--	--	12,810	--	--	12,810
Sapling and seedling	--	--	2,052	12,404	--	--	14,456
Nonstocked	--	--	2,052	6,299	5,965	--	14,316
Total	7,906	1,592	37,241	50,975	5,965	--	103,679
Western white pine:							
Sawtimber	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	5,229	--	--	--	--	5,229
Total	--	5,229	--	--	--	--	5,229
Lodgepole pine:							
Sawtimber	--	--	27,635	14,178	--	--	41,813
Poletimber	--	6,542	6,542	1,440	--	--	14,524
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--
Total	--	6,542	34,177	15,618	--	--	56,337
Western larch:							
Sawtimber	--	13,999	9,680	12,279	--	--	35,958
Poletimber	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--
Total	--	13,999	9,680	12,279	--	--	35,958

(con.)

Table 10. (con.)

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	Acres						
Western redcedar:							
Sawtimber	6,949	20,788	56,513	17,853	--	--	102,103
Poletimber	--	6,542	6,790	--	--	--	13,332
Sapling and seedling	--	34,266	13,897	14,449	--	--	62,612
Nonstocked	--	5,229	5,229	--	--	--	10,458
Total	6,949	66,825	82,429	32,302	--	--	188,505
Grand fir:							
Sawtimber	6,542	81,077	175,197	33,569	--	--	296,385
Poletimber	--	--	--	6,542	--	--	6,542
Sapling and seedling	--	--	31,644	16,134	--	--	47,778
Nonstocked	--	13,840	--	--	--	--	13,840
Total	6,542	94,917	206,841	56,245	--	--	364,545
Spruce-subalpine fir:							
Sawtimber	--	5,861	25,861	7,289	--	--	39,011
Poletimber	--	--	6,949	17	--	--	6,966
Sapling and seedling	--	--	13,768	--	--	--	13,768
Nonstocked	--	--	--	17	--	--	17
Total	--	5,861	46,578	7,323	--	--	59,762
Spruce:							
Sawtimber	--	4,363	19,352	--	--	--	23,715
Poletimber	--	--	--	--	--	--	--
Sapling and seedling	--	--	5,861	11,091	--	--	16,952
Nonstocked	--	--	--	--	--	--	--
Total	--	4,363	25,213	11,091	--	--	40,667
Aspen:							
Sawtimber	--	--	--	--	--	--	--
Poletimber	--	--	--	--	17	--	17
Sapling and seedling	--	--	--	--	--	26	26
Nonstocked	--	--	--	--	--	--	--
Total	--	--	--	--	17	26	43
Cottonwood:							
Sawtimber	--	7,906	--	--	--	--	7,906
Poletimber	--	--	--	--	9	--	9
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	62	--	--	62
Total	--	7,906	--	62	9	--	7,977
All types:							
Sawtimber	34,823	246,171	414,776	151,506	--	--	847,276
Poletimber	13,491	13,084	28,934	28,750	26	--	84,285
Sapling and seedling	--	39,495	80,942	66,357	--	26	186,820
Nonstocked	--	24,758	14,331	14,712	5,965	--	59,766
Total	48,314	323,508	538,983	261,325	5,991	26	1,178,147

Table 11.--Area of nonindustrial private timberland in Idaho by forest type, stand-size class, and productivity class, 1981

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	Acres						
Douglas-fir:							
Sawtimber	54,471	116,250	261,726	93,821	6,759	--	533,027
Poletimber	--	4,843	23,882	25,051	--	--	53,776
Sapling and seedling	4,843	11,141	33,432	18,730	--	--	68,146
Nonstocked	--	2,780	6,085	37,327	4,843	6,758	57,793
Total	59,314	135,014	325,125	174,929	11,602	6,758	712,742
Western hemlock:							
Sawtimber	--	--	6,298	9,044	--	--	15,342
Poletimber	--	--	6,299	--	--	--	6,299
Sapling and seedling	--	--	6,299	--	--	--	6,299
Nonstocked	--	--	--	--	--	--	--
Total	--	--	18,896	9,044	--	--	27,940
Mountain hemlock:							
Sawtimber	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--
Ponderosa pine:							
Sawtimber	4,843	75,047	131,949	74,035	--	--	285,874
Poletimber	4,729	--	6,759	6,299	--	--	17,787
Sapling and seedling	--	11,973	10,402	5,539	--	--	27,914
Nonstocked	--	--	38,759	35,239	12,191	--	86,189
Total	9,572	87,020	187,869	121,112	12,191	--	417,764
Western white pine:							
Sawtimber	13,887	--	--	--	--	--	13,887
Poletimber	--	4,843	--	--	--	--	4,843
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--
Total	13,887	4,843	--	--	--	--	18,730
Lodgepole pine:							
Sawtimber	11,141	6,299	34,516	21,147	4,843	--	77,946
Poletimber	13,887	--	14,528	27,588	--	--	56,003
Sapling and seedling	--	--	9,686	31,113	--	--	40,799
Nonstocked	--	--	5,888	10,382	--	--	16,270
Total	25,028	6,299	64,618	90,230	4,843	--	191,018
Western larch:							
Sawtimber	--	6,299	19,448	--	--	--	25,747
Poletimber	--	9,044	11,141	--	--	--	20,185
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--
Total	--	15,343	30,589	--	--	--	45,932

(con.)

Table 11. (con.)

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	5-19	
	Acres						
Western redcedar:							
Sawtimber	22,271	9,044	34,748	--	--	--	66,063
Poletimber	--	--	--	--	--	--	--
Sapling and seedling	--	4,843	--	--	--	--	4,843
Nonstocked	--	--	--	--	--	--	--
Total	22,271	13,887	34,748	--	--	--	70,906
Grand fir:							
Sawtimber	18,485	74,188	61,729	45,033	--	--	199,435
Poletimber	4,843	--	9,685	--	--	--	14,528
Sapling and seedling	--	--	21,833	26,347	--	--	48,180
Nonstocked	--	--	--	--	--	--	--
Total	23,328	74,188	93,247	71,380	--	--	262,143
Spruce-subalpine fir:							
Sawtimber	--	--	5,888	16,753	--	--	22,641
Poletimber	--	--	--	9,582	--	--	9,582
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	9,582	--	--	9,582
Total	--	--	5,888	35,917	--	--	41,805
Spruce:							
Sawtimber	--	--	--	6,759	--	--	6,759
Poletimber	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--
Total	--	--	--	6,759	--	--	6,759
Aspen:							
Sawtimber	--	--	--	--	--	--	--
Poletimber	--	--	--	14,501	48,734	4,834	68,069
Sapling and seedling	--	5,888	6,085	6,759	70,560	20,418	109,710
Nonstocked	--	--	--	--	--	4,834	4,834
Total	--	5,888	6,085	21,260	119,294	30,086	182,613
Cottonwood:							
Sawtimber	--	--	4,834	23,464	7,821	--	36,119
Poletimber	--	--	--	--	6,003	--	6,003
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	13,428	6,085	--	19,513
Total	--	--	4,834	36,892	19,909	--	61,635
All types:							
Sawtimber	125,098	287,127	561,136	290,056	19,423	--	1,282,840
Poletimber	23,459	18,730	72,294	83,021	54,737	4,834	257,075
Sapling and seedling	4,843	33,845	87,737	88,488	70,560	20,418	305,891
Nonstocked	--	2,780	50,732	105,958	23,119	11,592	194,181
Total	153,400	342,482	771,899	567,523	167,839	36,844	2,039,987

Table 12.--Area of State and privately owned timberland in Idaho by stand volume and ownership class, 1981

Stand volume per acre[1]	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	- - - - - - - - - - - - Acres - - - - - - - - - - - -			
Less than 1,500 board feet	294,515	216,307	570,930	1,081,752
1,500 to 4,999 board feet	182,611	281,030	457,944	921,585
5,000 to 9,999 board feet	170,796	326,858	513,809	1,011,463
10,000 board feet or more	382,058	353,952	497,304	1,233,314
All classes	1,029,980	1,178,147	2,039,987	4,248,114

[1]International $\frac{1}{4}$-inch rule.

Table 13.--Area of State and privately owned timberland in Idaho by forest type and area condition class, 1981

Forest type	Area condition class									Nonstocked	All classes
	10	20	30	40	50	60	70	80	90		
	Acres										
Douglas-fir	--	--	71,089	84,553	110,136	333,260	303,716	56,251	65,985	153,850	1,178,840
Western hemlock	--	--	14,414	198	40,478	24,186	8,275	9,272	40,644	2,855	140,322
Mountain hemlock	--	--	--	--	139	337	--	--	218	1,697	2,391
Ponderosa pine	--	--	--	5,933	51,288	181,272	275,008	--	29,016	150,962	693,479
Western white pine	--	--	--	--	29,663	17,369	13,290	--	32,102	11,050	103,474
Lodgepole pine	7,050	--	--	51,164	103,522	82,086	43,274	--	23,127	26,168	336,391
Western larch	--	11,382	--	6,989	44,735	20,221	2,580	5,891	23,874	--	115,672
Western redcedar	--	--	13,897	13,888	75,760	54,956	83,840	13,738	76,701	20,729	353,509
Grand fir	24,022	52,762	13,049	142,969	216,507	114,842	91,877	27,225	91,466	32,157	806,876
Spruce-subalpine fir	--	--	--	21,549	22,127	26,988	17,390	25,047	20,407	12,870	146,378
Spruce	--	--	5,861	--	3,145	11,573	12,404	6,960	17,826	1,691	59,460
Aspen	--	--	--	10,200	95,858	58,279	58,028	--	4,873	6,234	233,472
Cottonwood	--	--	--	--	7,907	24,348	23,204	--	--	22,391	77,850
All types	31,072	64,144	118,310	337,443	801,265	949,717	932,886	144,384	426,239	442,654	4,248,114

Table 14.--Number of growing stock trees on State and privately owned timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)															All classes
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand trees															
Douglas-fir	62,375	48,220	42,809	29,358	25,787	16,257	11,815	7,218	4,687	3,007	1,372	897	520	231	329	254,882
Ponderosa pine	9,690	16,638	13,725	10,164	6,662	6,868	3,929	3,212	1,630	1,516	752	545	270	134	292	76,027
Western white pine	10,081	2,489	2,726	970	1,817	1,399	1,237	518	610	398	227	156	147	62	207	23,044
Lodgepole pine	39,999	15,132	24,066	20,098	9,859	5,964	1,723	588	113	93	37	2	--	--	1	117,675
Limber pine	696	--	--	135	119	--	51	--	--	2	--	--	--	--	--	1,003
Western larch	11,098	14,008	16,576	11,122	6,458	3,757	2,436	1,486	741	449	256	165	84	64	97	68,797
Grand fir	125,324	71,795	37,694	20,067	15,061	8,636	6,109	3,903	2,198	1,334	607	474	384	226	552	294,364
Subalpine fir	9,561	6,651	5,973	4,276	1,678	2,025	782	450	102	102	51	13	53	3	4	31,724
Engelmann spruce	9,618	4,036	2,419	1,844	1,053	672	512	356	211	139	230	138	82	54	97	21,461
Western hemlock	41,824	17,628	10,183	4,537	3,007	2,126	1,239	679	536	311	171	105	77	54	64	82,541
Western redcedar	98,727	30,845	18,516	10,351	7,816	4,254	3,153	2,430	1,377	1,000	788	391	248	233	794	180,923
Total softwoods	418,993	227,442	174,687	112,922	79,317	51,958	32,986	20,840	12,205	8,351	4,491	2,886	1,865	1,061	2,437	1,152,441
Aspen	45,364	24,150	29,933	9,899	2,693	1,022	219	122	64	40	19	1	--	1	--	113,527
Cottonwood	2,510	870	1,039	234	587	791	549	416	359	146	175	142	48	29	118	8,013
Total hardwoods	47,874	25,020	30,972	10,133	3,280	1,813	768	538	423	186	194	143	48	30	118	121,540
All species	466,867	252,462	205,659	123,055	82,597	53,771	33,754	21,378	12,628	8,537	4,685	3,029	1,913	1,091	2,555	1,273,981

Table 15.--Number of cull and salvable dead trees on State and privately owned timberland in Idaho by ownership class, and softwoods and hardwoods, 1981

Ownership class and species group	Cull trees			Salvable dead trees	All dead trees
	Sound	Rotten	Total		
	Thousand trees				
State:					
Softwoods	5,080	1,858	6,938	1,387	8,325
Hardwoods	28	542	570	571	1,141
Total	5,108	2,400	7,508	1,958	9,466
Forest industry:					
Softwoods	359	2,881	3,240	16,181	19,421
Hardwoods	--	--	--	47	47
Total	359	2,881	3,240	16,228	19,468
Nonindustrial private:					
Softwoods	--	2,526	2,526	18,412	20,938
Hardwoods	--	2,483	2,483	6,384	8,867
Total	--	5,009	5,009	24,796	29,805
Total:					
Softwoods	5,439	7,265	12,704	35,980	48,684
Hardwoods	28	3,025	3,053	7,002	10,055
Total	5,467	10,290	15,757	42,982	58,739

Table 16.--Net volume of growing stock on State and privately owned timberland in Idaho by ownership class, forest type, and stand-size class, 1981

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
		- - - - - - - - - - Thousand cubic feet - - - - - - - - - -				
State:						
	Douglas-fir	288,072	34,444	7,846	1,403	331,765
	Western hemlock	144,001	5,884	2,954	--	152,839
	Mountain hemlock	70	30	--	51	151
	Ponderosa pine	234,832	20,252	3,665	7,310	266,059
	Western white pine	344,896	9,613	2,685	980	358,174
	Lodgepole pine	123,415	55,367	4,894	1,000	184,676
	Western larch	62,732	48,780	4,974	--	116,486
	Western redcedar	260,526	11,008	8,000	1,979	281,513
	Grand fir	470,184	7,293	2,755	3,112	483,344
	Spruce-subalpine fir	86,681	9,093	1,901	369	98,044
	Spruce	41,668	753	--	343	42,764
	Aspen	22,940	38,167	12,840	--	73,947
	Cottonwood	4,912	1,103	--	952	6,967
	All types	2,084,929	241,787	52,514	17,499	2,396,729
Forest industry:						
	Douglas-fir	453,604	53,554	9,470	2,122	518,750
	Western nemlock	129,287	11,239	--	--	140,526
	Mountain hemlock	--	--	--	--	--
	Ponderosa pine	66,071	10,144	15,135	1,660	93,010
	Western white pine	--	--	--	--	--
	Lodgepole pine	90,662	51,548	--	--	142,210
	Western larch	110,236	--	--	--	110,236
	Western redcedar	326,748	6,102	38,537	--	371,387
	Grand fir	714,490	1,800	11,578	--	727,868
	Spruce-subalpine fir	74,041	13,252	7,932	5	95,230
	Spruce	50,440	--	10,630	--	61,070
	Aspen	--	18	5	--	23
	Cottonwood	24,142	3	--	22	24,167
	All types	2,039,721	147,660	93,287	3,809	2,284,477
Nonindustrial private:						
	Douglas-fir	1,134,656	76,911	40,273	4,127	1,255,967
	Western hemlock	17,304	5,300	1,490	--	24,094
	Mountain hemlock	--	--	--	--	--
	Ponderosa pine	458,190	12,593	8,832	15,652	495,267
	Western white pine	62,262	504	--	--	62,766
	Lodgepole pine	196,810	154,723	22,004	1,223	374,760
	Western larch	105,018	44,857	--	--	149,875
	Western redcedar	247,254	--	--	--	247,254
	Grand fir	398,033	20,635	9,841	--	428,509
	Spruce-subalpine fir	55,836	3,339	--	2,982	62,157
	Spruce	14,204	--	--	--	14,204
	Aspen	--	73,638	21,244	--	94,882
	Cottonwood	63,476	2,456	--	5,672	71,604
	All types	2,753,043	394,956	103,684	29,656	3,281,339
Total:						
	Douglas-fir	1,876,332	164,909	57,589	7,652	2,106,482
	Western hemlock	290,592	22,423	4,444	--	317,459
	Mountain hemlock	70	30	--	51	151
	Ponderosa pine	759,093	42,989	27,632	24,622	854,336
	Western white pine	407,158	10,117	2,685	980	420,940
	Lodgepole pine	410,887	261,638	26,898	2,223	701,646
	Western larch	277,986	93,637	4,974	--	376,597
	Western redcedar	834,528	17,110	46,537	1,979	900,154
	Grand fir	1,582,707	29,728	24,174	3,112	1,639,721
	Spruce-subalpine fir	216,558	25,684	9,833	3,356	255,431
	Spruce	106,312	753	10,630	343	118,038
	Aspen	22,940	111,823	34,089	--	168,852
	Cottonwood	92,530	3,562	--	6,646	102,738
	All types	6,877,693	784,403	249,485	50,964	7,962,545

Table 17.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by ownership class, forest type, and stand-size class, 1981

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling, seedling	Nonstocked	
		- - - - Thousand board feet, International ¼-inch rule - - - -				
State:						
	Douglas-fir	1,314,932	45,313	26,324	7,148	1,393,717
	Western hemlock	739,075	12,523	11,078	--	762,676
	Mountain hemlock	265	--	--	--	265
	Ponderosa pine	1,270,107	29,655	13,469	44,730	1,357,961
	Western white pine	1,987,960	18,909	6,529	6,285	2,019,683
	Lodgepole pine	519,297	65,949	9,606	5,979	600,831
	Western larch	327,447	65,583	11,487	--	404,517
	Western redcedar	1,382,233	17,446	12,125	8,522	1,420,326
	Grand fir	2,535,844	8,453	8,416	4,656	2,557,369
	Spruce-subalpine fir	416,632	17,387	3,049	1,955	439,023
	Spruce	247,722	890	--	2,154	250,766
	Aspen	109,492	29,187	17,618	--	156,297
	Cottonwood	24,173	1,414	--	4,494	30,081
	All types	10,875,179	312,709	119,701	85,923	11,393,512
Forest industry:						
	Douglas-fir	2,220,057	118,065	27,265	6,694	2,372,081
	Western hemlock	493,102	27,735	--	--	520,837
	Mountain hemlock	--	--	--	--	--
	Ponderosa pine	306,125	23,672	59,422	4,935	394,154
	Western white pine	--	--	--	--	--
	Lodgepole pine	304,913	65,511	--	--	370,424
	Western larch	522,567	--	--	--	522,567
	Western redcedar	1,540,874	--	130,224	--	1,671,098
	Grand fir	3,050,979	--	30,054	--	3,081,033
	Spruce-subalpine fir	345,652	28,293	15,677	28	389,650
	Spruce	265,892	--	54,201	--	320,093
	Aspen	--	--	--	--	--
	Cottonwood	130,635	4	--	102	130,741
	All types	9,180,796	263,280	316,843	11,759	9,772,678
Nonindustrial private:						
	Douglas-fir	5,032,929	162,970	153,889	14,056	5,363,844
	Western hemlock	72,115	6,091	--	--	78,206
	Mountain hemlock	--	--	--	--	--
	Ponderosa pine	2,227,917	22,430	40,191	77,998	2,368,536
	Western white pine	340,526	--	--	--	340,526
	Lodgepole pine	705,374	232,972	87,543	--	1,025,889
	Western larch	535,592	84,229	--	--	619,821
	Western redcedar	1,045,945	--	--	--	1,045,945
	Grand fir	1,655,792	35,997	26,017	--	1,717,806
	Spruce-subalpine fir	214,497	3,026	--	15,693	233,216
	Spruce	61,566	--	--	--	61,566
	Aspen	--	41,447	43,337	--	84,784
	Cottonwood	307,618	3,152	--	26,776	337,546
	All types	12,199,871	592,314	350,977	134,523	13,277,685
Total:						
	Douglas-fir	8,567,918	326,348	207,478	27,898	9,129,642
	Western hemlock	1,304,292	46,349	11,078	--	1,361,719
	Mountain hemlock	265	--	--	--	265
	Ponderosa pine	3,804,149	75,757	113,082	127,663	4,120,651
	Western white pine	2,328,486	18,909	6,529	6,285	2,360,209
	Lodgepole pine	1,529,584	364,432	97,149	5,979	1,997,144
	Western larch	1,385,606	149,812	11,487	--	1,546,905
	Western redcedar	3,969,052	17,446	142,349	8,522	4,137,369
	Grand fir	7,242,615	44,450	64,487	4,656	7,356,208
	Spruce-subalpine fir	976,781	48,706	18,726	17,676	1,061,889
	Spruce	575,180	890	54,201	2,154	632,425
	Aspen	109,492	70,634	60,955	--	241,081
	Cottonwood	462,426	4,570	--	31,372	498,368
	All types	32,255,846	1,168,303	787,521	232,205	34,443,875

Table 18.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by ownership class, forest type, and stand-size class, 1981

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
		Thousand board feet, Scribner rule				
State:						
	Douglas-fir	1,113,526	36,338	22,196	5,537	1,177,597
	Western hemlock	637,251	10,539	9,489	--	657,279
	Mountain hemlock	180	--	--	--	180
	Ponderosa pine	1,074,048	23,809	10,872	38,379	1,147,108
	Western white pine	1,731,848	16,026	4,983	5,591	1,758,448
	Lodgepole pine	437,651	55,422	8,183	5,291	506,547
	Western larch	272,368	52,716	8,979	--	334,063
	Western redcedar	1,183,783	14,275	10,205	7,181	1,215,444
	Grand fir	2,193,146	6,792	7,169	3,777	2,210,884
	Spruce-subalpine fir	354,758	14,738	2,616	1,556	373,668
	Spruce	217,667	792	--	1,917	220,376
	Aspen	92,680	23,701	14,302	--	130,683
	Cottonwood	21,050	1,164	--	3,959	26,173
	All types	9,329,956	256,312	98,994	73,188	9,758,450
Forest industry:						
	Douglas-fir	1,886,112	92,802	23,349	5,434	2,007,697
	Western hemlock	415,558	22,899	--	--	438,457
	Mountain hemlock	--	--	--	--	--
	Ponderosa pine	253,765	17,869	46,854	3,756	322,244
	Western white pine	--	--	--	--	--
	Lodgepole pine	255,170	54,176	--	--	309,346
	Western larch	429,659	--	--	--	429,659
	Western redcedar	1,316,782	--	107,378	--	1,424,160
	Grand fir	2,603,166	--	23,939	--	2,627,105
	Spruce-subalpine fir	292,068	23,108	13,781	24	328,981
	Spruce	233,889	--	44,209	--	278,098
	Aspen	--	--	--	--	--
	Cottonwood	115,098	3	--	90	115,191
	All types	7,801,267	210,857	259,510	9,304	8,280,938
Nonindustrial private:						
	Douglas-fir	4,232,768	133,368	126,480	10,270	4,502,886
	Western hemlock	57,464	4,290	--	--	61,754
	Mountain hemlock	--	--	--	--	--
	Ponderosa pine	1,833,315	17,306	33,300	63,818	1,947,739
	Western white pine	290,452	--	--	--	290,452
	Lodgepole pine	584,041	196,409	71,739	--	852,189
	Western larch	447,329	68,724	--	--	516,053
	Western redcedar	870,058	--	--	--	870,058
	Grand fir	1,403,065	29,290	20,225	--	1,452,580
	Spruce-subalpine fir	182,467	2,693	--	13,390	198,550
	Spruce	54,049	--	--	--	54,049
	Aspen	--	33,209	37,669	--	70,878
	Cottonwood	265,178	2,593	--	23,438	291,209
	All types	10,220,186	487,882	289,413	110,916	11,108,397
Total:						
	Douglas-fir	7,232,406	262,508	172,025	21,241	7,688,180
	Western hemlock	1,110,273	37,728	9,489	--	1,157,490
	Mountain hemlock	180	--	--	--	180
	Ponderosa pine	3,161,128	58,984	91,026	105,953	3,417,091
	Western white pine	2,022,300	16,026	4,983	5,591	2,048,900
	Lodgepole pine	1,276,862	306,007	79,922	5,291	1,668,082
	Western larch	1,149,356	121,440	8,979	--	1,279,775
	Western redcedar	3,370,623	14,275	117,583	7,181	3,509,662
	Grand fir	6,199,377	36,082	51,333	3,777	6,290,569
	Spruce-subalpine fir	829,293	40,539	16,397	14,970	901,199
	Spruce	505,605	792	44,209	1,917	552,523
	Aspen	92,680	56,910	51,971	--	201,561
	Cottonwood	401,326	3,760	--	27,487	432,573
	All types	27,351,409	955,051	647,917	193,408	29,147,785

Table 19.--Net volume of growing stock on State and privately owned timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)													All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand cubic feet													
Douglas-fir	130,264	185,549	275,818	287,660	308,012	255,882	216,713	173,889	100,392	80,193	58,032	30,670	70,904	2,173,978
Ponderosa pine	19,760	45,085	57,471	108,230	96,311	107,212	78,802	88,440	57,877	54,327	32,614	21,831	70,478	838,438
Western white pine	12,160	6,691	27,476	35,199	45,432	27,588	42,207	36,369	25,705	21,417	24,280	12,585	83,658	400,767
Lodgepole pine	124,492	185,934	146,700	135,750	52,490	26,588	5,672	5,770	2,971	80	--	--	187	686,634
Limber pine	--	1,529	1,243	--	1,432	--	--	176	--	--	--	--	--	4,380
Western larch	57,541	81,935	87,399	81,034	73,815	61,278	41,869	33,679	20,844	17,326	11,043	9,238	21,630	598,631
Grand fir	104,077	130,913	189,457	183,994	198,983	170,931	132,840	104,594	60,908	51,329	53,981	38,827	149,765	1,570,599
Subalpine fir	22,089	30,048	18,595	36,374	18,151	16,275	4,076	5,427	3,419	1,092	4,642	323	560	161,071
Engelmann spruce	8,422	12,365	14,010	13,871	16,024	14,060	13,129	11,008	22,533	15,487	11,815	9,380	22,622	184,726
Western hemlock	22,681	31,853	37,413	42,312	35,973	27,524	28,526	20,238	14,402	9,013	8,168	7,362	10,237	295,702
Western redcedar	61,097	63,120	80,439	63,169	65,838	66,003	49,089	43,641	40,839	23,708	18,683	20,870	159,046	755,542
Total softwoods	562,583	775,022	936,021	987,593	912,461	773,341	612,923	523,231	349,890	273,972	223,258	151,086	589,087	7,670,468
Aspen	71,743	56,840	27,156	15,127	5,023	4,742	2,951	1,913	1,430	217	--	269	--	187,411
Cottonwood	1,611	493	5,375	13,143	12,247	12,904	13,444	6,655	9,837	8,364	3,047	3,257	14,289	104,666
Total hardwoods	73,354	57,333	32,531	28,270	17,270	17,646	16,395	8,568	11,267	8,581	3,047	3,526	14,289	292,077
All species	635,937	832,355	968,552	1,015,863	929,731	790,987	629,318	531,799	361,157	282,553	226,305	154,612	603,376	7,962,545

Table 20.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	1,029,008	1,443,590	1,649,611	1,415,848	1,223,309	993,496	582,489	470,253	345,568	185,420	433,257	9,771,849
Ponderosa pine	191,400	492,858	509,110	603,664	465,111	529,089	353,266	332,909	202,678	141,768	475,431	4,297,284
Western white pine	116,636	197,827	261,917	161,881	242,154	215,621	157,708	130,963	147,498	80,102	517,782	2,230,089
Lodgepole pine	644,728	789,649	303,560	151,401	31,826	31,657	16,266	481	--	--	1,138	1,970,706
Limber pine	3,733	--	8,178	--	--	1,057	--	--	--	--	--	12,968
Western larch	377,300	485,924	444,445	371,099	253,384	205,516	129,199	110,866	71,077	59,636	139,878	2,648,324
Grand fir	730,227	978,968	1,094,920	942,230	719,490	566,401	330,912	272,125	290,930	229,472	832,149	6,987,824
Subalpine fir	76,986	192,848	98,245	88,727	22,880	30,335	20,181	6,822	26,517	2,004	3,508	569,053
Engelmann spruce	58,310	76,720	89,760	79,443	73,953	62,391	125,825	90,572	72,029	59,115	147,210	935,328
Western hemlock	146,152	212,359	190,744	152,377	158,843	113,136	84,571	52,175	48,449	44,283	61,183	1,264,272
Western redcedar	305,788	318,456	337,574	337,533	250,305	222,241	205,459	121,444	99,758	112,831	812,758	3,124,147
Total softwoods	3,680,268	5,189,199	4,988,064	4,304,203	3,441,255	2,970,940	2,005,876	1,588,610	1,304,504	914,631	3,424,294	33,811,844
Aspen	XXXXX	78,835	26,819	24,644	15,430	9,225	7,304	1,294	--	1,612	--	165,163
Cottonwood	XXXXX	67,523	62,199	64,004	64,784	31,058	44,927	37,739	13,593	15,019	66,022	466,868
Total hardwoods	XXXXX	146,358	89,018	88,648	80,214	40,283	52,231	39,033	13,593	16,631	66,022	632,031
All species	3,680,268	5,335,557	5,077,082	4,392,851	3,521,469	3,011,223	2,058,107	1,627,643	1,318,097	931,262	3,490,316	34,443,875

Table 21.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Douglas-fir	805,137	1,155,838	1,381,216	1,211,775	1,060,966	868,701	518,415	418,526	307,555	165,024	385,599	8,278,752
Ponderosa pine	126,278	369,656	410,271	500,221	393,356	450,788	303,321	289,015	177,539	125,882	422,975	3,569,302
Western white pine	96,038	163,670	224,604	141,817	214,345	191,863	139,720	116,514	131,267	71,291	460,825	1,951,954
Lodgepole pine	537,154	658,044	260,003	133,797	28,249	28,173	14,476	428	--	--	1,013	1,661,337
Limber pine	3,322	--	6,956	--	--	941	--	--	--	--	--	11,219
Western larch	281,441	361,153	353,822	308,567	217,586	180,077	113,864	98,568	63,258	53,075	124,492	2,155,903
Grand fir	591,294	804,000	937,267	821,357	635,164	503,172	294,486	242,154	258,928	204,230	740,613	6,032,665
Subalpine fir	62,792	156,784	82,373	76,822	19,934	26,748	17,946	6,072	23,600	1,782	3,122	477,975
Engelmann spruce	47,755	62,836	75,956	68,175	64,555	54,831	111,984	80,609	64,106	52,613	131,017	814,437
Western hemlock	115,720	173,148	164,270	134,752	141,370	100,690	74,665	46,375	43,120	39,411	54,453	1,087,974
Western redcedar	246,333	243,841	261,876	263,132	196,984	177,945	168,386	101,677	84,802	97,205	719,083	2,561,264
Total softwoods	2,913,264	4,148,970	4,158,614	3,660,415	2,972,509	2,583,929	1,757,263	1,399,938	1,154,175	810,513	3,043,192	28,602,782
Aspen	XXXXX	63,072	22,685	21,716	13,691	8,210	6,501	1,152	--	1,435	--	138,462
Cottonwood	XXXXX	55,957	52,970	55,627	56,846	27,430	39,934	33,553	12,097	13,367	58,760	406,541
Total hardwoods	XXXXX	119,029	75,655	77,343	70,537	35,640	46,435	34,705	12,097	14,802	58,760	545,003
All species	2,913,264	4,267,999	4,234,269	3,737,758	3,043,046	2,619,569	1,803,698	1,434,643	1,166,272	825,315	3,101,952	29,147,785

Table 22.--Net volume of growing stock on State and privately owned timberland in Idaho by ownership class and species, 1981

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	GROWING STOCK - - - - - - - - Thousand cubic feet - - - - - - - -			
Douglas-fir	561,380	467,252	1,145,346	2,173,978
Ponderosa pine	194,811	142,582	501,045	838,438
Western white pine	217,045	67,373	116,349	400,767
Lodgepole pine	164,118	136,458	386,058	686,634
Limber pine	377	--	4,003	4,380
Western larch	175,713	191,240	231,678	598,631
Grand fir	504,146	665,841	400,612	1,570,599
Subalpine fir	58,735	62,436	39,900	161,071
Engelmann spruce	83,893	72,281	28,552	184,726
Western hemlock	106,633	129,446	59,623	295,702
Western redcedar	262,302	332,032	161,208	755,542
Total softwoods	2,329,153	2,266,941	3,074,374	7,670,468
Aspen	61,518	4,151	121,742	187,411
Cottonwood	6,058	13,385	85,223	104,666
Total hardwoods	67,576	17,536	206,965	292,077
All species	2,396,729	2,284,477	3,281,339	7,962,545

Table 23.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by ownership class and species, 1981

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	SAWTIMBER - Thousand board feet, International ¼-inch rule -			
Douglas-fir	2,614,890	2,127,471	5,029,488	9,771,849
Ponderosa pine	1,052,672	731,704	2,512,908	4,297,284
Western white pine	1,266,364	357,587	606,138	2,230,089
Lodgepole pine	487,189	395,398	1,088,119	1,970,706
Limber pine	1,640	--	11,328	12,968
Western larch	732,414	954,108	961,802	2,648,324
Grand fir	2,677,986	2,707,735	1,602,103	6,987,824
Subalpine fir	226,044	227,754	115,255	569,053
Engelmann spruce	477,373	323,176	134,779	935,328
Western hemlock	518,913	530,114	215,245	1,264,272
Western redcedar	1,249,712	1,347,336	527,099	3,124,147
Total softwoods	11,305,197	9,702,383	12,804,264	33,811,844
Aspen	67,941	8,079	89,143	165,163
Cottonwood	20,374	62,216	384,278	466,868
Total hardwoods	88,315	70,295	473,421	632,031
All species	11,393,512	9,772,678	13,277,685	34,443,875

Table 24.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by ownership class and species, 1981

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	SAWTIMBER			
	- - - - - Thousand board feet, Scribner rule - - - - -			
Douglas-fir	2,228,856	1,815,509	4,234,387	8,278,752
Ponderosa pine	889,000	610,818	2,069,484	3,569,302
Western white pine	1,111,201	314,499	526,254	1,951,954
Lodgepole pine	411,860	333,309	916,168	1,661,337
Limber pine	1,450	--	9,769	11,219
Western larch	607,310	784,992	763,601	2,155,903
Grand fir	2,334,929	2,328,359	1,369,377	6,032,665
Subalpine fir	191,089	191,811	95,075	477,975
Engelmann spruce	417,554	279,759	117,124	814,437
Western hemlock	451,668	456,194	180,112	1,087,974
Western redcedar	1,039,069	1,103,403	418,792	2,561,264
Total softwoods	9,683,986	8,218,653	10,700,143	28,602,782
Aspen	56,578	7,139	74,745	138,462
Cottonwood	17,886	55,146	333,509	406,541
Total hardwoods	74,464	62,285	408,254	545,003
All species	9,758,450	8,280,938	11,108,397	29,147,785

Table 25.--Net volume of timber on State and privately owned timberland in Idaho by class of timber, and softwoods and hardwoods, 1981

Class of timber	Softwoods	Hardwoods	All classes
	- - - - - - Thousand cubic feet - - - - -		
Sawtimber trees:			
Saw-log portion	5,642,965	100,668	5,743,633
Upper-stem portion	689,898	28,190	718,088
Total	6,332,863	128,858	6,461,721
Poletimber trees	1,337,605	163,219	1,500,824
All growing stock trees	7,670,468	292,077	7,962,545
Sound cull trees	36,268	17	36,285
Rotten cull trees	53,460	4,796	58,256
Salvable dead trees	336,814	21,401	358,215
All timber	8,097,010	318,291	8,415,301

Table 26.--Net volume of growing stock on State and privately owned timberland in Idaho by forest type and species, 1981

Forest type	Species								
	Douglas-fir	Ponderosa pine	Western white pine	Lodgepole pine	Limber pine	Western larch	Grand fir	Subalpine fir	Engelmann spruce
	Thousand cubic feet								
Douglas-fir	1,486,484	170,323	20,728	46,495	--	104,898	160,158	12,030	7,143
Western hemlock	22,305	1,181	15,018	4,686	--	27,728	24,938	3,034	6,292
Mountain hemlock	--	--	--	--	--	--	--	--	51
Ponderosa pine	158,339	590,993	5,981	34,048	--	25,729	24,724	331	2,526
Western white pine	30,662	1,976	189,716	8,487	176	29,815	87,916	2,068	7,252
Lodgepole pine	73,964	21,364	4,309	517,607	--	40,036	18,162	1,689	5,541
Western larch	44,726	8,844	24,738	9,474	82	215,272	24,550	1,302	4,610
Western redcedar	63,359	3,880	56,456	24,270	--	67,213	197,086	2,410	8,236
Grand fir	217,854	24,906	78,486	23,930	--	69,499	1,022,900	7,875	16,105
Spruce-subalpine fir	34,096	33	3,223	12,019	--	7,844	3,149	122,878	52,021
Spruce	10,542	399	2,112	468	4,122	10,597	7,016	6,945	74,892
Aspen	29,330	3,680	--	5,150	--	--	--	509	57
Cottonwood	2,317	10,859	--	--	--	--	--	--	--
All types	2,173,978	838,438	400,767	686,634	4,380	598,631	1,570,599	161,071	184,726

Table 26.(con.)

Forest Type	Species						
	Western hemlock	Western redcedar	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	Thousand cubic feet						
Douglas-fir	8,663	57,655	2,074,577	27,548	4,357	31,905	2,106,482
Western hemlock	159,304	49,587	314,073	1,880	1,506	3,386	317,459
Mountain hemlock	100	--	151	--	--	--	151
Ponderosa pine	1,356	4,201	848,228	5,058	1,050	6,108	854,336
Western white pine	5,167	55,657	418,892	2,048	--	2,048	420,940
Lodgepole pine	2,501	10,745	695,918	5,728	--	5,728	701,646
Western larch	9,782	27,684	371,064	455	5,078	5,533	376,597
Western redcedar	54,553	415,547	893,010	2,556	4,588	7,144	900,154
Grand fir	41,498	128,064	1,631,117	1,971	6,633	8,604	1,639,721
Spruce-subalpine fir	12,656	5,366	253,285	2,146	--	2,146	255,431
Spruce	122	823	118,038	--	--	--	118,038
Aspen	--	213	38,939	129,913	--	129,913	168,852
Cottonwood	--	--	13,176	8,108	81,454	89,562	102,738
All types	295,702	755,542	7,670,468	187,411	104,666	292,077	7,962,545

Table 27.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by forest type and species, 1981

Forest type	Species								
	Douglas-fir	Ponderosa pine	Western white pine	Lodgepole pine	Limber pine	Western larch	Grand fir	Subalpine fir	Engelmann spruce
	Thousand board feet, International ¼-inch rule								
Douglas-fir	6,594,650	902,645	109,573	159,580	--	391,448	682,114	24,956	34,847
Western hemlock	87,391	6,524	79,891	22,625	--	125,771	89,261	16,404	37,232
Mountain hemlock	--	--	--	--	--	--	--	--	--
Ponderosa pine	726,821	2,988,271	32,150	142,268	--	83,745	109,494	460	11,032
Western white pine	166,165	12,038	1,088,674	44,972	1,057	183,475	497,167	10,734	40,660
Lodgepole pine	295,032	97,037	17,088	1,296,181	--	188,850	38,296	5,332	13,700
Western larch	200,566	52,398	139,590	25,350	246	885,055	84,703	5,215	24,888
Western redcedar	303,815	21,700	333,183	115,720	--	353,249	884,670	12,606	42,246
Grand fir	1,031,054	124,362	401,536	83,951	--	326,079	4,555,229	29,489	83,787
Spruce-subalpine fir	181,694	--	17,244	49,920	--	44,683	14,491	426,709	235,630
Spruce	54,140	2,735	11,160	2,803	11,665	65,969	32,399	35,507	411,306
Aspen	117,701	22,141	--	27,336	--	--	--	1,641	--
Cottonwood	12,820	67,433	--	--	--	--	--	--	--
All types	9,771,849	4,297,284	2,230,089	1,970,706	12,968	2,648,324	6,987,824	569,053	935,328

Table 27. (con.)

Forest Type	Species						
	Western hemlock	Western redcedar	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	Thousand board feet, International ¼-inch rule						
Douglas-fir	12,832	197,254	9,109,899	8,783	10,960	19,743	9,129,642
Western hemlock	680,562	207,896	1,353,557	1,295	6,867	8,162	1,361,719
Mountain hemlock	265	--	265	--	--	--	265
Ponderosa pine	6,074	20,336	4,120,651	--	--	--	4,120,651
Western white pine	22,499	284,851	2,352,292	7,917	--	7,917	2,360,209
Lodgepole pine	9,493	22,143	1,983,152	13,992	--	13,992	1,997,144
Western larch	41,753	67,040	1,526,804	1,616	18,485	20,101	1,546,905
Western redcedar	239,944	1,803,093	4,110,226	5,501	21,642	27,143	4,137,369
Grand fir	190,063	491,774	7,317,324	6,542	32,342	38,884	7,356,208
Spruce-subalpine fir	60,255	24,571	1,055,197	6,692	--	6,692	1,061,889
Spruce	532	4,209	632,425	--	--	--	632,425
Aspen	--	980	169,799	71,282	--	71,282	241,081
Cottonwood	--	--	80,253	41,543	376,572	418,115	498,368
All types	1,264,272	3,124,147	33,811,844	165,163	466,868	632,031	34,443,875

Table 28.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by forest type and species, 1981

Forest type	Species								
	Douglas-fir	Ponderosa pine	Western white pine	Lodgepole pine	Limber pine	Western larch	Grand fir	Subalpine fir	Engelmann spruce
	Thousand board feet, Scribner rule								
Douglas-fir	5,570,298	763,721	95,605	134,195	--	306,703	584,670	21,073	29,969
Western hemlock	74,667	5,627	69,001	19,294	--	101,909	77,375	13,581	32,742
Mountain hemlock	--	--	--	--	--	--	--	--	--
Ponderosa pine	615,866	2,465,097	27,228	120,723	--	64,208	92,012	410	9,632
Western white pine	144,584	10,218	953,799	38,002	941	154,358	437,013	9,126	35,237
Lodgepole pine	248,052	79,563	14,527	1,086,877	--	151,934	33,226	4,557	11,751
Western larch	169,452	44,654	120,316	21,234	219	719,131	72,082	4,351	21,741
Western redcedar	261,525	17,883	295,623	98,433	--	291,341	773,759	10,904	36,762
Grand fir	881,626	101,747	350,807	72,843	--	272,478	3,921,742	23,594	71,569
Spruce-subalpine fir	156,835	--	15,139	43,347	--	35,150	12,687	358,200	204,559
Spruce	45,616	2,435	9,909	2,483	10,059	58,691	28,099	30,802	360,475
Aspen	99,173	19,098	--	23,906	--	--	--	1,377	--
Cottonwood	11,058	59,259	--	--	--	--	--	--	--
All types	8,278,752	3,569,302	1,951,954	1,661,337	11,219	2,155,903	6,032,665	477,975	814,437

Table 28. (con.)

Forest Type	Species						
	Western hemlock	Western redcedar	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	Thousand board feet, International ¼-inch rule						
Douglas-fir	10,676	154,008	7,670,918	7,507	9,755	17,262	7,688,180
Western hemlock	588,392	167,638	1,150,226	1,152	6,112	7,264	1,157,490
Mountain hemlock	180	--	180	--	--	--	180
Ponderosa pine	4,763	17,152	3,417,091	--	--	--	3,417,091
Western white pine	19,713	239,024	2,042,015	6,885	--	6,885	2,048,900
Lodgepole pine	7,358	17,898	1,655,743	12,339	--	12,339	1,668,082
Western larch	35,428	53,377	1,261,985	1,425	16,365	17,790	1,279,775
Western redcedar	208,573	1,490,946	3,485,749	4,815	19,098	23,913	3,509,662
Grand fir	162,256	397,595	6,256,257	5,782	28,530	34,312	6,290,569
Spruce-subalpine fir	50,162	19,373	895,452	5,747	--	5,747	901,199
Spruce	473	3,481	552,523	--	--	--	552,523
Aspen	--	772	144,326	57,235	--	57,235	201,561
Cottonwood	--	--	70,317	35,575	326,681	362,256	432,573
All types	1,087,974	2,561,264	28,602,782	138,462	406,541	545,003	29,147,785

Table 29.--Net annual growth of growing stock on State and privately owned timberland in Idaho by ownership class and species, 1980

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	GROWING STOCK - - - - - - - Thousand cubic feet - - - - - - -			
Douglas-fir	15,187	12,997	37,181	65,365
Ponderosa pine	5,600	3,929	18,419	27,948
Western white pine	2,244	-651	2,966	4,559
Lodgepole pine	4,376	3,050	10,652	18,078
Limber pine	7	--	50	57
Western larch	4,652	2,714	5,637	13,003
Grand fir	13,982	24,027	14,988	52,997
Subalpine fir	1,878	3,232	2,918	8,028
Engelmann spruce	1,463	1,998	523	3,984
Western hemlock	3,047	4,373	1,838	9,258
Western redcedar	5,783	14,636	5,980	26,399
Total softwoods	58,219	70,305	101,152	229,676
Aspen	3,017	206	7,577	10,800
Cottonwood	180	396	2,212	2,788
Total hardwoods	3,197	602	9,789	13,588
All species	61,416	70,907	110,941	243,264

Table 30.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by ownership class and species, 1980

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	SAWTIMBER - Thousand board feet, International ¼-inch rule -			
Douglas-fir	79,266	63,832	170,380	313,478
Ponderosa pine	28,765	20,988	94,924	144,677
Western white pine	11,901	2,880	21,693	36,474
Lodgepole pine	15,541	8,579	38,047	62,167
Limber pine	264	--	66	330
Western larch	12,486	16,129	15,762	44,377
Grand fir	75,879	94,661	52,897	223,437
Subalpine fir	6,818	5,190	928	12,936
Engelmann spruce	7,423	7,222	2,384	17,029
Western hemlock	14,031	15,194	6,382	35,607
Western redcedar	27,704	26,347	13,716	67,767
Total softwoods	280,078	261,022	417,179	958,279
Aspen	7,719	319	4,935	12,973
Cottonwood	465	1,748	7,850	10,063
Total hardwoods	8,184	2,067	12,785	23,036
All species	288,262	263,089	429,964	981,315

Table 31.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by ownership class and species, 1980

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	SAWTIMBER			
	- - - - Thousand board feet, Scribner rule - - - -			
Douglas-fir	70,718	57,478	153,837	282,033
Ponderosa pine	24,354	18,312	82,322	124,988
Western white pine	11,128	2,747	19,839	33,714
Lodgepole pine	14,145	8,108	34,641	56,894
Limber pine	235	--	60	295
Western larch	11,257	14,840	14,489	40,586
Grand fir	66,880	85,021	48,436	200,337
Subalpine fir	6,201	4,751	1,095	12,047
Engelmann spruce	6,656	6,488	2,146	15,290
Western hemlock	12,565	14,041	6,002	32,608
Western redcedar	23,889	22,551	11,853	58,293
Total softwoods	248,028	234,337	374,720	857,085
Aspen	5,949	298	4,044	10,291
Cottonwood	428	1,629	7,327	9,384
Total hardwoods	6,377	1,927	11,371	19,675
All species	254,405	236,264	386,091	876,760

Table 32.--Net annual growth of growing stock on State and privately owned timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)													All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand cubic feet													
Douglas-fir	10,633	7,566	10,148	9,663	8,984	6,913	4,660	3,224	1,649	805	656	265	199	65,365
Ponderosa pine	3,805	2,574	2,756	3,863	3,528	2,731	2,210	2,260	1,557	734	719	317	894	27,948
Western white pine	-59	-586	1,314	802	744	541	785	398	346	107	74	-314	407	4,559
Lodgepole pine	4,915	5,266	3,745	3,329	410	459	-188	108	30	2	--	--	2	18,078
Limber pine	--	34	14	--	6	--	--	3	--	--	--	--	--	57
Western larch	4,230	2,169	1,788	1,738	1,588	640	568	348	228	-490	100	-4	100	13,003
Grand fir	13,168	6,163	7,357	6,265	6,617	4,341	2,845	1,910	1,078	564	797	450	1,442	52,997
Subalpine fir	5,262	860	357	402	491	355	77	116	24	8	65	5	6	8,028
Engelmann spruce	572	521	518	493	417	306	179	202	208	142	130	101	195	3,984
Western hemlock	1,977	1,497	1,307	1,183	1,058	639	579	380	246	119	101	83	89	9,258
Western redcedar	13,167	2,045	2,796	1,602	1,758	1,514	813	618	408	102	179	240	1,157	26,399
Total softwoods	57,670	28,109	32,100	29,340	25,601	18,439	12,528	9,567	5,774	2,093	2,821	1,143	4,491	229,676
Aspen	7,800	1,432	765	359	148	150	68	30	42	3	--	3	--	10,800
Cottonwood	265	69	235	627	402	-127	435	-16	229	246	79	51	293	2,788
Total hardwoods	8,065	1,501	1,000	986	550	23	503	14	271	249	79	54	293	13,588
All species	65,735	29,610	33,100	30,326	26,151	18,462	13,031	9,581	6,045	2,342	2,900	1,197	4,784	243,264

Table 33.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	87,512	59,497	55,052	41,721	28,129	19,279	9,930	5,119	4,144	1,681	1,414	313,478
Ponderosa pine	19,510	26,088	23,751	18,785	14,412	14,435	9,837	4,575	4,491	2,315	6,478	144,677
Western white pine	12,895	5,268	4,545	3,131	4,250	2,393	2,204	667	455	-1,830	2,496	36,474
Lodgepole pine	38,384	19,348	2,227	2,463	-1,037	588	173	11	--	--	10	62,167
Limber pine	279	--	35	--	--	16	--	--	--	--	--	330
Western larch	14,541	10,707	9,668	3,914	3,451	2,362	1,486	-3,004	634	-38	656	44,377
Grand fir	77,100	38,802	37,513	23,113	13,645	9,836	5,574	2,972	4,213	2,678	7,991	223,437
Subalpine fir	4,057	2,382	2,737	1,956	442	681	163	50	403	28	37	12,936
Engelmann spruce	2,763	2,738	2,323	1,677	984	1,171	1,386	1,021	921	706	1,339	17,029
Western hemlock	8,670	7,488	6,191	3,749	3,367	2,218	1,515	730	626	511	542	35,607
Western redcedar	24,552	8,745	9,102	7,457	4,067	2,988	1,989	594	972	1,295	6,006	67,767
Total softwoods	290,263	181,063	153,144	107,966	71,710	55,967	34,257	12,735	16,859	7,346	26,969	958,279
Aspen	XXXXX	10,724	801	743	338	133	196	22	--	16	--	12,973
Cottonwood	XXXXX	3,206	1,936	-823	1,838	-180	984	1,086	362	242	1,412	10,063
Total hardwoods	XXXXX	13,930	2,737	-80	2,176	-47	1,180	1,108	362	258	1,412	23,036
All species	290,263	194,993	155,881	107,886	73,886	55,920	35,437	13,843	17,221	7,604	28,381	981,315

Table 34.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand board feet, Scribner rule											
Douglas-fir	77,814	53,825	50,001	37,713	25,466	17,377	8,838	4,557	3,688	1,496	1,258	282,033
Ponderosa pine	13,688	22,897	20,992	16,785	12,713	12,681	8,756	4,356	4,190	2,072	5,858	124,988
Western white pine	11,594	5,123	4,402	2,911	3,916	2,150	2,020	600	405	-1,629	2,222	33,714
Lodgepole pine	34,672	17,799	2,300	2,312	-884	523	154	10	--	--	8	56,894
Limber pine	248	--	32	--	--	15	--	--	--	--	--	295
Western larch	12,688	9,823	9,001	3,853	3,202	2,189	1,374	-2,658	564	-34	584	40,586
Grand fir	65,936	36,047	34,563	21,362	12,657	8,916	4,964	2,647	3,750	2,384	7,111	200,337
Subalpine fir	3,770	2,350	2,507	1,788	404	621	146	44	358	26	33	12,047
Engelmann spruce	2,478	2,471	2,093	1,520	893	1,053	1,234	909	820	628	1,191	15,290
Western hemlock	7,727	6,949	5,927	3,467	2,997	1,973	1,409	665	557	455	482	32,608
Western redcedar	21,757	7,264	7,241	5,898	3,354	2,747	1,919	630	886	1,179	5,418	58,293
Total softwoods	252,372	164,548	139,059	97,609	64,718	50,245	30,814	11,760	15,218	6,577	24,165	857,085
Aspen	XXXXX	8,215	745	691	313	119	174	20	--	14	--	10,291
Cottonwood	XXXXX	2,947	1,785	-603	1,710	-107	887	970	322	216	1,257	9,384
Total hardwoods	XXXXX	11,162	2,530	88	2,023	12	1,061	990	322	230	1,257	19,675
All species	252,372	175,710	141,589	97,697	66,741	50,257	31,875	12,750	15,540	6,807	25,422	876,760

Table 35.--Annual mortality of growing stock on State and privately owned timberland in Idaho by ownership class and species, 1980

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	GROWING STOCK - - - - - - Thousand cubic feet - - - - - -			
Douglas-fir	613	1,490	3,089	5,192
Ponderosa pine	219	1,336	1,485	3,040
Western white pine	2,072	1,796	1,014	4,882
Lodgepole pine	366	561	851	1,778
Limber pine	--	--	--	--
Western larch	234	961	1,312	2,507
Grand fir	489	2,592	2,994	6,075
Subalpine fir	138	--	481	619
Engelmann spruce	147	--	--	147
Western hemlock	32	214	277	523
Western redcedar	24	632	153	809
Total softwoods	4,334	9,582	11,656	25,572
Aspen	89	1	1,468	1,558
Cottonwood	14	--	713	727
Total hardwoods	103	1	2,181	2,285
All species	4,437	9,583	13,837	27,857

Table 36.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by ownership class and species, 1980

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	SAWTIMBER - Thousand board feet, International ¼-inch rule -			
Douglas-fir	3,335	4,931	13,013	21,279
Ponderosa pine	1,128	6,993	7,019	15,140
Western white pine	12,241	2,714	3,366	18,321
Lodgepole pine	1,020	3,227	2,653	6,900
Limber pine	--	--	--	--
Western larch	1,208	4,008	3,536	8,752
Grand fir	2,696	10,689	11,445	24,830
Subalpine fir	626	--	2,035	2,661
Engelmann spruce	886	--	--	886
Western hemlock	156	966	1,326	2,448
Western redcedar	138	2,168	770	3,076
Total softwoods	23,434	35,696	45,163	104,293
Aspen	101	--	--	101
Cottonwood	66	--	3,468	3,534
Total hardwoods	167	--	3,468	3,635
All species	23,601	35,696	48,631	107,928

Table 37.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by ownership class and species, 1980

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	SAWTIMBER			
	- - - Thousand board feet, Scribner rule - - -			
Douglas-fir	2,893	4,198	10,876	17,967
Ponderosa pine	943	5,719	5,685	12,347
Western white pine	10,688	2,378	2,879	15,945
Lodgepole pine	861	2,685	2,323	5,869
Limber pine	--	--	--	--
Western larch	1,019	3,475	3,143	7,637
Grand fir	2,341	9,153	9,749	21,243
Subalpine fir	524	--	1,715	2,239
Engelmann spruce	777	--	--	777
Western hemlock	125	742	1,050	1,917
Western redcedar	110	1,811	594	2,515
Total softwoods	20,281	30,161	38,014	88,456
Aspen	88	--	--	88
Cottonwood	57	--	2,997	3,054
Total hardwoods	145	--	2,997	3,142
All species	20,426	30,161	41,011	91,598

Table 38.--Annual mortality of growing stock on State and privately owned timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)													All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand cubic feet													
Douglas-fir	400	640	788	516	1,042	376	532	56	44	371	36	59	332	5,192
Ponderosa pine	139	73	154	604	405	1,037	288	--	--	326	--	--	14	3,040
Western white pine	725	1,076	34	549	821	150	249	343	--	161	181	418	175	4,882
Lodgepole pine	174	393	347	--	577	--	287	--	--	--	--	--	--	1,778
Limber pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western larch	414	383	569	34	10	453	--	--	--	590	--	54	--	2,507
Grand fir	311	759	909	1,145	538	824	932	273	35	323	--	--	26	6,075
Subalpine fir	--	--	281	338	--	--	--	--	--	--	--	--	--	619
Engelmann spruce	--	--	--	--	--	49	66	--	--	32	--	--	--	147
Western hemlock	--	--	309	214	--	--	--	--	--	--	--	--	--	523
Western redcedar	--	171	--	157	--	--	--	20	237	224	--	--	--	809
Total softwoods	2,163	3,495	3,391	3,557	3,393	2,889	2,354	692	316	2,027	217	531	547	25,572
Aspen	509	896	135	18	--	--	--	--	--	--	--	--	--	1,558
Cottonwood	--	--	--	--	--	540	--	187	--	--	--	--	--	727
Total hardwoods	509	896	135	18	--	540	--	187	--	--	--	--	--	2,285
All species	2,672	4,391	3,526	3,575	3,393	3,429	2,354	879	316	2,027	217	531	547	27,857

Table 39.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand board feet, International ¼-inch rule											
Douglas-fir	2,837	2,629	5,534	2,050	2,961	339	269	2,148	230	371	1,911	21,279
Ponderosa pine	461	2,666	2,305	5,921	1,723	--	--	1,970	--	--	94	15,140
Western white pine	144	3,054	4,756	899	1,528	2,154	--	1,024	1,150	2,496	1,116	18,321
Lodgepole pine	2,005	--	3,318	--	1,577	--	--	--	--	--	--	6,900
Limber pine	--	--	--	--	--	--	--	--	--	--	--	--
Western larch	1,686	207	58	2,738	--	--	--	3,697	--	366	--	8,752
Grand fir	3,359	6,076	2,893	4,373	4,828	1,351	228	1,552	--	--	170	24,830
Subalpine fir	862	1,799	--	--	--	--	--	--	--	--	--	2,661
Engelmann spruce	--	--	--	288	389	--	--	209	--	--	--	886
Western hemlock	1,482	966	--	--	--	--	--	--	--	--	--	2,448
Western redcedar	--	790	--	--	--	118	1,117	1,051	--	--	--	3,076
Total softwoods	12,836	18,187	18,864	16,269	13,006	3,962	1,614	11,651	1,380	3,233	3,291	104,293
Aspen	--	101	--	--	--	--	--	--	--	--	--	101
Cottonwood	--	--	--	2,661	--	873	--	--	--	--	--	3,534
Total hardwoods	--	101	--	2,661		873	--	--	--	--	--	3,635
All species	12,836	18,288	18,864	18,930	13,006	4,835	1,614	11,651	1,380	3,233	3,291	107,928

Table 40.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand board feet, Scribner rule											
Douglas-fir	2,227	2,130	4,623	1,746	2,554	299	240	1,912	205	330	1,701	17,967
Ponderosa pine	279	1,961	1,916	4,938	1,468	--	--	1,701	--	--	84	12,347
Western white pine	114	2,500	4,128	782	1,356	1,917	--	911	1,023	2,221	993	15,945
Lodgepole pine	1,623	--	2,849	--	1,397	--	--	--	--	--	--	5,869
Limber pine	--	--	--	--	--	--	--	--	--	--	--	--
Western larch	1,501	154	44	2,327	--	--	--	3,285	--	326	--	7,637
Grand fir	2,816	5,015	2,446	3,808	4,240	1,183	202	1,381	--	--	152	21,243
Subalpine fir	760	1,479	--	--	--	--	--	--	--	--	--	2,239
Engelmann spruce	--	--	--	250	341	--	--	186	--	--	--	777
Western hemlock	1,176	741	--	--	--	--	--	--	--	--	--	1,917
Western redcedar	--	610	--	--	--	94	933	878				2,515
Total softwoods	10,496	14,590	16,006	13,851	11,356	3,493	1,375	10,254	1,228	2,877	2,930	88,456
Aspen	XXXXX	88	--	--	--	--	--	--	--	--	--	88
Cottonwood	XXXXX	--	--	2,293	--	761	--	--	--	--	--	3,054
Total hardwoods	XXXXX	88	--	2,293	--	761	--	--	--	--	--	3,142
All species	10,496	14,678	16,006	16,144	11,356	4,254	1,375	10,254	1,228	2,877	2,930	91,598

Table 41.--Annual mortality of growing stock on State and privately owned timberland in Idaho by cause of death and species, 1980

Species	Cause of Death								Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	
	GROWING STOCK Thousand cubic feet								
Douglas-fir	341	1,714	40	--	2,017	--	--	1,080	5,192
Ponderosa pine	1,796	642	--	--	193	53	22	334	3,040
Western white pine	821	4,014	--	--	--	--	47	--	4,882
Lodgepole pine	544	839	--	--	--	393	--	2	1,778
Limber pine	--	--	--	--	--	--	--	--	--
Western larch	1,160	643	--	--	278	--	15	411	2,507
Grand fir	2,342	3,243	--	--	198	--	76	216	6,075
Subalpine fir	14	17	--	--	--	--	--	588	619
Engelmann spruce	--	--	--	--	118	--	--	29	147
Western hemlock	--	--	--	--	23	--	214	286	523
Western redcedar	--	157	--	--	482	--	170	--	809
Total softwoods	7,018	11,269	40	--	3,309	446	544	2,946	25,572
Aspen	--	1,183	--	--	--	--	18	357	1,558
Cottonwood	--	--	--	--	--	--	--	727	727
Total hardwoods	--	1,183	--	--	--	--	18	1,084	2,285
All species	7,018	12,452	40	--	3,309	446	562	4,030	27,857

Table 42.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by cause of death and species, 1980

Species	Cause of Death								Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	
	SAWTIMBER Thousand board feet, International ¼-inch rule								
Douglas-fir	1,824	5,606	248	--	11,172	--	--	2,429	21,279
Ponderosa pine	9,208	3,670	--	--	914	--	103	1,245	15,140
Western white pine	3,951	14,370	--	--	--	--	--	--	18,321
Lodgepole pine	2,065	4,835	--	--	--	--	--	--	6,900
Limber pine	--	--	--	--	--	--	--	--	--
Western larch	5,055	917	--	--	366	--	--	2,414	8,752
Grand fir	9,654	13,799	--	--	274	--	--	1,103	24,830
Subalpine fir	77	96	--	--	--	--	--	2,488	2,661
Engelmann spruce	--	--	--	--	714	--	--	172	886
Western hemlock	--	--	--	--	113	--	966	1,369	2,448
Western redcedar	--	790	--	--	2,286	--	--	--	3,076
Total softwoods	31,834	44,083	248	--	15,839	--	1,069	11,220	104,293
Aspen	--	--	--	--	--	--	101	--	101
Cottonwood	--	--	--	--	--	--	--	3,534	3,534
Total hardwoods	--	--	--	--	--	--	101	3,534	3,635
All species	31,834	44,083	248	--	15,839	--	1,170	14,754	107,928

Table 43.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by cause of death and species, 1980

Species	Cause of Death								Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	
	SAWTIMBER Thousand board feet, Scribner rule								
Douglas-fir	1,515	4,744	221	--	9,617	--	--	1,870	17,967
Ponderosa pine	7,655	3,062	--	--	698	--	79	853	12,347
Western white	3,474	12,471	--	--	--	--	--	--	15,945
Lodgepole pine	1,824	4,045	--	--	--	--	--	--	5,869
Limber pine	--	--	--	--	--	--	--	--	--
Western larch	4,473	787	--	--	326	--	--	2,051	7,637
Grand fir	8,276	11,823	--	--	244	--	--	900	21,243
Subalpine fir	61	80	--	--	--	--	--	2,098	2,239
Engelmann spruce	--	--	--	--	627	--	--	150	777
Western hemlock	--	--	--	--	90	--	742	1,085	1,917
Western redcedar	--	610	--	--	1,905	--	--	--	2,515
Total softwoods	27,278	37,622	221	--	13,507	--	821	9,007	88,456
Aspen	--	--	--	--	--	--	88	--	88
Cottonwood	--	--	--	--	--	--	--	3,054	3,054
Total hardwoods	--	--	--	--	--	--	88	3,054	3,142
All species	27,278	37,622	221	--	13,507	--	909	12,061	91,598

Table 44.--Annual removals[1] of growing stock on State and privately owned timberland in Idaho by ownership class and species, 1980

Species	Ownership class			
	State	Forest industry	Nonindustrial private	Total
	GROWING STOCK - - - - - - - - Thousands cubic feet - - - - - - - -			
Douglas-fir	6,363	26,555	16,677	49,595
Engelmann spruce	880	3,670	2,305	6,855
Lodgepole pine	2,442	10,193	6,401	19,036
Ponderosa pine	3,366	14,048	8,822	26,236
True firs[2]	7,362	30,722	19,293	57,377
Western larch	1,730	7,220	4,534	13,484
Western hemlock	450	1,880	1,181	3,511
Western redcedar	3,830	15,982	10,036	29,848
Western white pine	2,639	11,015	6,918	20,572
Other species	90	374	236	700
Total	29,152	121,659	76,403	227,214

[1]Includes sawlogs, veneer logs, pulpwood, cedar products, utility poles, houselogs, posts and poles, logging residues, and other removals.

[2]Includes grand and subalpine fir.

Table 45.--Annual removals[1] of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by ownership class and species, 1980

Species	Ownership class			
	State	Forest industry	Nonindustrial private	Total
	SAWTIMBER - Thousand board feet - International ¼-inch rule -			
Douglas-fir	36,545	152,572	96,261	285,378
Engelmann spruce	5,051	21,089	13,306	39,446
Lodgepole pine	14,027	58,562	36,948	109,537
Ponderosa pine	19,333	80,712	50,922	150,967
True firs[2]	42,279	176,512	111,363	330,154
Western larch	9,936	41,482	26,171	77,589
Western hemlock	2,587	10,801	6,814	20,202
Western redcedar	21,995	91,825	57,933	171,753
Western white pine	15,159	63,285	39,927	118,371
Other species	516	2,153	1,358	4,027
Total	167,428	698,993	441,003	1,307,424

[1]Includes sawlogs, veneer logs, pulpwood, cedar products, utility poles, houselogs, posts and poles, logging residues, and other removals.

[2]Includes grand and subalpine fir.

Table 46.--Annual removals[1] of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by ownership class and species, 1980

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	SAWTIMBER			
	- - - - Thousand board feet - Scribner rule - - - -			
Douglas-fir	30,338	126,714	79,548	236,600
Engelmann spruce	4,193	17,515	10,995	32,703
Lodgepole pine	11,645	48,637	30,533	90,815
Ponderosa pine	16,049	67,033	42,082	125,164
True firs[2]	35,098	146,595	92,030	273,723
Western larch	8,248	34,452	21,628	64,328
Western hemlock	2,148	8,970	5,632	16,750
Western redcedar	18,259	76,263	47,877	142,399
Western white pine	12,584	52,559	32,996	98,139
Other species	428	1,788	1,122	3,338
Total	138,990	580,526	364,443	1,083,959

[1]Includes sawlogs, veneer logs, pulpwood, cedar products, utility poles, houselogs, posts and poles, logging residues, and other removals.

[2]Includes grand and subalpine fir.

Table 47.--Annual removals of growing stock on State and privately owned timberland in Idaho by source and ownership class, 1980

Source	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	GROWING STOCK			
	- - - - - - - Thousand cubic feet - - - - - - -			
Roundwood products:				
Sawlogs	15,527	55,091	53,521	124,139
Veneer logs	5,420	27,280	1,221	33,921
Total	20,947	82,371	54,742	158,060
Other roundwood products:				
Pulpwood	3,209	22,825	11,194	37,228
Cedar products	732	2,244	1,126	4,102
Utility poles	771	80	392	1,243
Houselogs	79	51	59	189
Posts and poles	69	131	125	325
Total	4,860	25,331	12,896	43,087
Total roundwood products	25,807	107,702	67,638	201,147
Logging residues	3,048	12,720	7,988	23,756
Other removals	297	1,237	777	2,311
Total removals	29,152	121,659	76,403	227,214

Table 48.--Annual removals of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by source and ownership class, 1980

Source	Ownership class			
	State	Forest industry	Nonindustrial private	Total
	SAWTIMBER Thousand board feet International ¼-inch rule			
Roundwood products:				
Sawlogs	96,848	343,625	333,832	774,305
Veneer logs	33,807	170,157	7,616	211,580
Total	130,655	513,782	341,448	985,885
Other roundwood products:				
Pulpwood	17,712	125,982	61,785	205,479
Cedar products	3,403	10,433	5,235	19,071
Utility poles	3,585	372	1,822	5,779
Houselogs	367	237	274	878
Posts and poles	285	540	516	1,341
Total	25,352	137,564	69,632	232,548
Total roundwood products	156,007	651,346	411,080	1,218,433
Logging residues	9,571	39,944	25,084	74,599
Other removals	1,850	7,703	4,839	14,392
Total removals	167,428	698,993	441,003	1,307,424

Table 49.--Annual removals of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by source and ownership class, 1980

Source	Ownership class			
	State	Forest industry	Nonindustrial private	Total
	SAWTIMBER Thousand board feet Scribner rule			
Roundwood products:				
Sawlogs	77,638	275,456	267,605	620,699
Veneer logs	27,099	136,398	6,103	169,600
Total	104,737	411,854	273,708	790,299
Other roundwood products:				
Pulpwood	16,043	114,126	55,972	186,141
Cedar products	3,660	11,222	5,628	20,510
Utility poles	3,855	400	1,958	6,213
Houselogs	393	256	296	945
Posts and poles	138	262	250	650
Total	24,089	126,266	64,104	214,459
Total roundwood products	128,826	538,120	337,812	1,004,758
Logging residues	8,518	35,550	22,325	66,393
Other removals	1,646	6,856	4,306	12,808
Total removals	138,990	580,526	364,443	1,083,959

Table 50.--Area of State and privately owned woodland in Idaho by ownership class, and forest type, 1981

Forest type	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	- - - - - - - - - - - - Acres - - - - - - - - - - - -			
Pinyon-juniper woodland	4,865	--	38,570	43,435
Juniper woodland	27,531	211	62,159	89,901
Western juniper	14,195	--	28,545	42,740
Total woodland softwoods	46,591	211	129,274	176,076
Oak woodland	13	--	--	13
Mountain brush woodland	5,263	423	19,059	24,745
Ripiarian woodland	400	795	56,729	57,924
Other west hardwoods	5,559	8,751	43,310	57,620
Total woodland hardwoods	11,235	9,969	119,098	140,302
All types	57,826	10,180	248,372	316,378

Table 51.--Net volume of State and privately owned woodland in Idaho by ownership class and species, 1981

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	WOODLAND - - - - - - - Thousand cubic feet - - - - - - -			
Douglas-fir	664	--	2,634	3,298
Western redcedar	3	--	348	351
Aspen	103	--	--	103
Cottonwood	5	--	530	535
Pinyon/juniper	31,225	29	71,038	102,292
Woodland hardwoods	2,700	522	23,952	27,174
Total all species	34,700	551	98,502	133,753

Table 52.--Net annual growth of State and privately owned woodland in Idaho by ownership class and species, 1980

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	WOODLAND - - - - - - - Thousand cubic feet - - - - - -			
Douglas-fir	21	--	82	103
Western redcedar	([1])	--	18	18
Aspen	4	--	--	4
Cottonwood	([1])	--	19	19
Pinyon/juniper	649	2	1,198	1,849
Woodland hardwoods	36	28	987	1,051
Total all species	710	30	2,304	3,044

[1]Less than 500 cubic feet.

Table 53.--Annual mortality of State and privately owned woodland in Idaho by ownership class and species, 1980

Species	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	WOODLAND - - - - - - - Thousand cubic feet - - - - - -			
Douglas-fir	--	--	--	--
Western redcedar	--	--	--	--
Aspen	--	--	--	--
Cottonwood	--	--	--	--
Pinyon/juniper	77	--	--	77
Woodland hardwoods	([1])	1	26	27
Total all species	77	1	26	104

[1]Less than 500 cubic feet.

MARKETING ZONE TABLES

Table 54.--Area of State and privately owned timberland in Idaho by marketing zone and ownership class, 1981

Marketing zone	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	- - - - - - - - - - - - Acres - - - - - - - - - - - -			
Northern Idaho:				
Panhandle	357,891	417,423	857,767	1,633,081
Northern	356,927	575,790	597,089	1,529,806
Total	714,818	993,213	1,454,856	3,162,887
Southern Idaho:				
Southwestern	193,258	184,673	232,473	610,404
Southeastern	121,904	261	352,658	474,823
Total	315,162	184,934	585,131	1,085,227
Total Idaho	1,029,980	1,178,147	2,039,987	4,248,114

Table 55.--Net volume of growing stock on State and privately owned timberland in Idaho by marketing zone and ownership class, 1981

Marketing zone	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	GROWING STOCK - - - - - - - - Thousand cubic feet - - - - - - - -			
Northern Idaho:				
Panhandle	846,593	853,098	1,537,274	3,236,965
Northern	983,208	1,158,350	1,021,449	3,163,007
Total	1,829,801	2,011,448	2,558,723	6,399,972
Southern Idaho:				
Southwestern	347,644	272,655	339,246	959,545
Southeastern	219,284	374	383,370	603,028
Total	566,928	273,029	722,616	1,562,573
Total Idaho	2,396,729	2,284,477	3,281,339	7,962,545

Table 56.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by marketing zone and ownership class, 1981

Marketing zone	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	SAWTIMBER - Thousand board feet, International ¼-inch rule -			
Northern Idaho:				
Panhandle	3,939,981	3,560,827	6,061,026	13,561,834
Northern	5,041,650	5,041,146	4,411,545	14,494,341
Total	8,981,631	8,601,973	10,472,571	28,056,175
Southern Idaho:				
Southwestern	1,682,927	1,169,389	1,511,060	4,363,376
Southeastern	728,954	1,316	1,294,054	2,024,324
Total	2,411,881	1,170,705	2,805,114	6,387,700
Total Idaho	11,393,512	9,772,678	13,277,685	34,443,875

Table 57.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by marketing zone and ownership class, 1981

Marketing zone	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	SAWTIMBER - - - - - - - - - Scribner rule - - - - - - - - - -			
Northern Idaho:				
Panhandle	3,364,795	3,007,604	5,041,234	11,413,633
Northern	4,349,653	4,291,916	3,707,799	12,349,368
Total	7,714,448	7,299,520	8,749,033	23,763,001
Southern Idaho:				
Southwestern	1,430,518	980,322	1,271,831	3,682,671
Southeastern	613,484	1,096	1,087,533	1,702,113
Total	2,044,002	981,418	2,359,364	5,384,784
Total Idaho	9,758,450	8,280,938	11,108,397	29,147,785

Table 58.--Net annual growth of growing stock on State and privately owned timberland in Idaho by marketing zone and ownership class, 1980

Marketing zone	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	GROWING STOCK - - - - - - - - Thousand cubic feet - - - - - - - -			
Northern Idaho:				
Panhandle	23,962	29,078	55,672	108,712
Northern	20,301	32,737	32,128	85,166
Total	44,263	61,815	87,800	193,878
Southern Idaho:				
Southwestern	10,262	9,079	8,747	28,088
Southeastern	6,891	13	14,394	21,298
Total	17,153	9,092	23,141	49,386
Total Idaho	61,416	70,907	110,941	243,264

Table 59.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by marketing zone and ownership class, 1980

Marketing zone	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	SAWTIMBER - Thousand board feet, International ¼-inch rule -			
Northern Idaho:				
Panhandle	107,440	96,987	211,241	415,668
Northern	98,477	118,321	127,107	343,905
Total	205,917	215,308	338,348	759,573
Southern Idaho:				
Southwestern	52,145	47,725	42,505	142,375
Southeastern	30,200	56	49,111	79,367
Total	82,345	47,781	91,616	221,742
Total Idaho	288,262	263,089	429,964	981,315

Table 60.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by marketing zone and ownership class, 1980

Marketing zone	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	SAWTIMBER - - - - - - - - - Scribner rule - - - - - - - - -			
Northern Idaho:				
Panhandle	95,927	87,575	190,572	374,074
Northern	86,859	106,416	114,269	307,544
Total	182,786	193,991	304,841	681,618
Southern Idaho:				
Southwestern	45,659	42,224	37,838	125,721
Southeastern	25,960	49	43,412	69,421
Total	71,619	42,273	81,250	195,142
Total Idaho	254,405	236,264	386,091	876,760

Table 61.--Annual mortality of growing stock on State and privately owned timberland in Idaho by marketing zone and ownership class, 1980

Marketing zone	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	GROWING STOCK - - - - - - - Thousand cubic feet - - - - - - -			
Northern Idaho:				
Panhandle	1,050	3,323	5,827	10,200
Northern	2,908	5,159	4,307	12,374
Total	3,958	8,482	10,134	22,574
Southern Idaho				
Southwestern	368	1,098	1,198	2,664
Southeastern	111	3	2,505	2,619
Total	479	1,101	3,703	5,283
Total Idaho	4,437	9,583	13,837	27,857

Table 62.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by marketing zone and ownership class, 1980

Marketing zone	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	SAWTIMBER - Thousand board feet, International ¼-inch rule -			
Northern Idaho:				
Panhandle	4,553	11,852	21,638	38,043
Northern	16,838	18,217	16,738	51,793
Total	21,391	30,069	38,376	89,836
Southern Idaho				
Southwestern	1,988	5,618	4,380	11,986
Southeastern	222	9	5,875	6,106
Total	2,210	5,627	10,255	18,092
Total Idaho	23,601	35,696	48,631	107,928

Table 63.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by marketing zone and ownership class, 1980

Marketing zone	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	SAWTIMBER - - - - - - - - Scribner rule - - - - - - - -			
Northern Idaho:				
Panhandle	3,909	9,940	18,089	31,938
Northern	14,635	15,471	14,216	44,322
Total	18,544	25,411	32,305	76,260
Southern Idaho:				
Southwestern	1,696	4,742	3,759	10,197
Southeastern	186	8	4,947	5,141
Total	1,882	4,750	8,706	15,338
Total Idaho	20,426	30,161	41,011	91,598

Table 64.--Annual removals of growing stock on State and privately owned timberland in Idaho by marketing zone and ownership class, 1980

Marketing zone	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	GROWING STOCK - - - - - - - - Thousand cubic feet - - - - - - - -			
Northern Idaho:				
Panhandle	4,932	21,816	42,574	69,322
Northern	21,361	80,072	28,813	130,246
Total	26,293	101,888	71,387	199,568
Southern Idaho:				
Southwestern	2,388	19,742	4,860	26,990
Southeastern	471	29	156	656
Total	2,859	19,771	5,016	27,646
Total Idaho	29,152	121,659	76,403	227,214

Table 65.--Annual removals of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by marketing zone and ownership class, 1980

Marketing zone	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	SAWTIMBER - Thousand board feet, International ¼-inch rule -			
Northern Idaho:				
Panhandle	28,417	124,573	244,842	397,832
Northern	122,252	458,830	166,884	747,966
Total	150,669	583,403	411,726	1,145,798
Southern Idaho:				
Southwestern	13,973	115,417	28,359	157,749
Southeastern	2,786	173	918	3,877
Total	16,759	115,590	29,277	161,626
Total Idaho	167,428	698,993	441,003	1,307,424

Table 66.--Annual removals of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by marketing zone and ownership class, 1980

Marketing zone	Ownership class			Total
	State	Forest industry	Nonindustrial private	
	SAWTIMBER - - - - - - - - - Scribner rule - - - - - - - - -			
Northern Idaho:				
Panhandle	23,352	103,810	202,959	330,121
Northern	102,012	382,339	137,543	621,894
Total	125,364	486,149	340,502	952,015
Southern Idaho:				
Southwestern	11,375	94,237	23,202	128,814
Southeastern	2,251	140	739	3,130
Total	13,626	94,377	23,941	131,944
Total Idaho	138,990	580,526	364,443	1,083,959

Table 67.--Area of State and privately owned timberland in Idaho by county and ownership class, 1981

County	State	Private	Total
	- - - - - - - - - Acres - - - - - - - - -		
Northern Idaho:			
Benewah	47,545	274,176	321,721
Bonner	152,261	322,825	475,086
Boundary	85,163	144,542	229,705
Clearwater	222,734	420,181	642,915
Idaho	61,123	243,949	305,072
Kootenai	31,723	310,571	342,294
Latah	41,199	223,076	264,275
Lewis	1,461	75,266	76,727
Nez Perce	6,959	102,557	109,516
Shoshone	64,650	330,926	395,576
Total	714,818	2,448,069	3,162,887
Southern Idaho:			
Ada	165	3,389	3,554
Adams	28,078	93,860	121,938
Bannock	19,752	31,298	51,050
Bear Lake	1,539	11,653	13,192
Bingham	8,714	42,321	51,035
Blaine	2,930	15,044	17,974
Boise	65,567	98,277	163,844
Bonneville	8,001	35,454	43,455
Butte	300	2,265	2,565
Camas	2,198	7,302	9,500
Canyon	3	2,634	2,637
Caribou	26,220	52,496	78,716
Cassia	708	4,203	4,911
Clark	5,737	8,785	14,522
Custer	4,074	8,725	12,799
Elmore	13,892	26,800	40,692
Franklin	3,700	17,730	21,430
Fremont	16,321	33,223	49,544
Gem	569	3,418	3,987
Gooding	6	646	652
Jefferson	23	1,599	1,622
Jerome	1	608	609
Lemhi	4,189	25,263	29,452
Lincoln	1	352	353
Madison	10,900	10,384	21,284
Minidoka	--	489	489
Oneida	810	2,883	3,693
Owyhee	3,252	31,275	34,527
Payette	1	932	933
Power	4,935	16,251	21,186
Teton	844	21,441	22,285
Twin Falls	1	2,504	2,505
Valley	69,805	145,052	214,857
Washington	11,926	11,509	23,435
Total	315,162	770,065	1,085,227
Total Idaho	1,029,980	3,218,134	4,248,114

Table 68.--Area of State and privately owned woodland in Idaho by county and ownership class, 1981

County	State	Private	Total
	- - - - - - - Acres - - - - - - -		
Northern Idaho:			
Benewah	19	1,703	1,722
Bonner	143	19,847	19,990
Boundary	24	9,106	9,130
Clearwater	20	1,240	1,260
Idaho	--	3,089	3,089
Kootenai	--	2,318	2,318
Latah	61	1,331	1,392
Lewis	--	509	509
Nez Perce	--	1,218	1,218
Shoshone	--	1,236	1,236
Total	267	41,597	41,864
Southern Idaho:			
Ada	250	1,405	1,655
Adams	150	3,355	3,505
Bannock	2,659	23,408	26,067
Bear Lake	109	5,364	5,473
Bingham	1,041	11,946	12,987
Blaine	92	1,874	1,966
Boise	740	4,458	5,198
Bonneville	940	6,127	7,067
Butte	10	137	147
Camas	32	90	122
Canyon	--	251	251
Caribou	2,903	9,305	12,208
Cassia	6,176	16,354	22,530
Clark	143	1,110	1,253
Custer	102	788	890
Elmore	815	6,279	7,094
Franklin	700	10,049	10,749
Fremont	186	1,422	1,608
Gem	1	3,136	3,137
Gooding	--	--	--
Jefferson	--	479	479
Jerome	--	--	--
Lemhi	12	2,254	2,266
Lincoln	--	--	--
Madison	834	2,435	3,269
Minidoka	--	--	--
Oneida	260	6,870	7,130
Owyhee	38,162	66,328	104,490
Payette	--	121	121
Power	797	17,974	18,771
Teton	37	3,303	3,340
Twin Falls	--	1,103	1,103
Valley	406	1,068	1,474
Washington	2	8,162	8,164
Total	57,559	216,955	274,514
Total Idaho	57,826	258,552	316,378

Table 69.--Net volume of growing stock on State and privately owned timberland in Idaho by county and ownership class, 1981

County	State	Private	Total
	- - - - - - Thousand cubic feet - - - - - -		
Northern Idaho:			
Benewah	144,924	559,449	704,373
Bonner	352,852	584,727	937,579
Boundary	167,640	248,719	416,359
Clearwater	617,072	780,890	1,397,962
Idaho	148,993	433,591	582,584
Kootenai	80,516	593,589	674,105
Latah	100,661	403,888	504,549
Lewis	2,889	110,479	113,368
Nez Perce	13,736	147,488	161,224
Shoshone	200,518	707,351	907,869
Total	1,829,801	4,570,171	6,399,972
Southern Idaho:			
Ada	238	4,653	4,891
Adams	60,307	137,184	197,491
Bannock	39,411	31,970	71,381
Bear Lake	2,509	10,975	13,484
Bingham	14,192	39,737	53,929
Blaine	6,304	22,679	28,983
Boise	96,181	150,759	246,940
Bonneville	12,459	34,179	46,638
Butte	454	3,250	3,704
Camas	5,910	8,524	14,434
Canyon	2	3,114	3,116
Caribou	44,164	51,804	95,968
Cassia	1,368	4,209	5,577
Clark	11,374	10,301	21,675
Custer	8,812	14,470	23,282
Elmore	20,301	35,764	56,065
Franklin	6,074	9,934	16,008
Fremont	25,680	42,625	68,305
Gem	877	4,697	5,574
Gooding	3	706	709
Jefferson	13	1,561	1,574
Jerome	([1])	345	345
Lemhi	8,558	38,633	47,191
Lincoln	1	200	201
Madison	17,477	14,255	31,732
Minidoka	--	278	278
Oneida	1,387	1,438	2,825
Owyhee	4,744	34,116	38,860
Payette	1	1,174	1,175
Power	11,530	15,620	27,150
Teton	1,603	23,969	25,572
Twin Falls	1	2,082	2,083
Valley	139,327	223,234	362,561
Washington	25,666	17,206	42,872
Total	566,928	995,645	1,562,573
Total Idaho	2,396,729	5,565,816	7,962,545

Table 70.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by county and ownership class, 1981

County	State	Private	Total
	Thousand board feet - - - - - - - International ¼-inch rule - - - - -		
Northern Idaho:			
Benewah	702,648	2,323,151	3,025,799
Bonner	1,613,105	2,170,629	3,783,734
Boundary	744,222	930,726	1,674,948
Clearwater	3,202,570	3,379,310	6,581,880
Idaho	766,746	1,936,534	2,703,280
Kootenai	364,395	2,440,992	2,805,387
Latah	515,611	1,756,355	2,271,966
Lewis	14,319	488,973	503,292
Nez Perce	70,703	651,035	721,738
Shoshone	987,312	2,996,839	3,984,151
Total	8,981,631	19,074,544	28,056,175
Southern Idaho:			
Ada	1,122	21,204	22,326
Adams	298,961	605,730	904,691
Bannock	148,766	97,511	246,277
Bear Lake	7,750	32,769	40,519
Bingham	38,071	126,616	164,687
Blaine	24,220	102,225	126,445
Boise	456,377	678,228	1,134,605
Bonneville	33,872	97,167	131,039
Butte	1,759	14,834	16,593
Camas	27,257	34,558	61,815
Canyon	7	14,132	14,139
Caribou	136,761	137,795	274,556
Cassia	5,113	16,866	21,979
Clark	42,689	32,444	75,133
Custer	35,835	67,918	103,753
Elmore	95,845	159,320	255,165
Franklin	18,871	17,967	36,838
Fremont	72,713	140,374	213,087
Gem	4,155	21,935	26,090
Gooding	16	3,391	3,407
Jefferson	62	6,863	6,925
Jerome	2	1,634	1,636
Lemhi	32,103	178,401	210,504
Lincoln	4	946	950
Madison	45,608	53,292	98,900
Minidoka	--	1,315	1,315
Oneida	4,946	4,468	9,414
Owyhee	22,362	111,129	133,491
Payette	4	5,652	5,656
Power	46,521	46,265	92,786
Teton	6,012	72,362	78,374
Twin Falls	3	7,389	7,392
Valley	677,075	984,742	1,661,817
Washington	127,019	78,377	205,396
Total	2,411,881	3,975,819	6,387,700
Total Idaho	11,393,512	23,050,363	34,443,875

Table 71.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by county and ownership class, 1981

County	State	Private	Total
	- - - Thousand board feet, Scribner rule - - -		
Northern Idaho:			
Benewah	604,298	1,949,797	2,554,095
Bonner	1,376,750	1,801,953	3,178,703
Boundary	630,553	771,530	1,402,083
Clearwater	2,764,419	2,872,267	5,636,686
Idaho	660,663	1,646,814	2,307,477
Kootenai	309,346	2,039,307	2,348,653
Latah	443,848	1,486,251	1,930,099
Lewis	12,268	410,876	423,144
Nez Perce	60,837	547,299	608,136
Shoshone	851,466	2,522,459	3,373,925
Total	7,714,448	16,048,553	23,763,001
Southern Idaho:			
Ada	939	17,923	18,862
Adams	256,596	508,506	765,102
Bannock	125,498	81,293	206,791
Bear Lake	6,526	27,578	34,104
Bingham	31,977	106,570	138,547
Blaine	20,387	86,920	107,307
Boise	382,022	569,844	951,866
Bonneville	28,390	81,113	109,503
Butte	1,482	12,561	14,043
Camas	23,134	29,040	52,174
Canyon	6	12,035	12,041
Caribou	114,962	114,837	229,799
Cassia	4,304	14,287	18,591
Clark	35,935	27,077	63,012
Custer	30,219	57,678	87,897
Elmore	80,149	134,000	214,149
Franklin	15,865	15,000	30,865
Fremont	60,950	117,199	178,149
Gem	3,473	18,607	22,080
Gooding	14	2,907	2,921
Jefferson	52	5,886	5,938
Jerome	1	1,380	1,381
Lemhi	27,028	151,131	178,159
Lincoln	3	799	802
Madison	38,209	45,045	83,254
Minidoka	--	1,111	1,111
Oneida	4,166	3,810	7,976
Owyhee	18,781	93,160	111,941
Payette	3	4,860	4,863
Power	39,327	38,564	77,891
Teton	5,053	60,587	65,640
Twin Falls	2	6,256	6,258
Valley	579,556	827,070	1,406,626
Washington	108,993	66,148	175,141
Total	2,044,002	3,340,782	5,384,784
Total Idaho	9,758,450	19,389,335	29,147,785

Table 72.--Net annual growth of growing stock on State and privately owned timberland in Idaho by county and ownership class, 1980

County	State	Private	Total
	- - - - - Thousand cubic feet - - - - -		
Northern Idaho:			
Benewah	3,230	18,914	22,144
Bonner	10,606	22,634	33,240
Boundary	5,462	10,028	15,490
Clearwater	12,378	22,041	34,419
Idaho	3,308	10,507	13,815
Kootenai	2,452	20,607	23,059
Latah	2,212	12,567	14,779
Lewis	74	3,914	3,988
Nez Perce	302	5,190	5,492
Shoshone	4,239	23,213	27,452
Total	44,263	149,615	193,878
Southern Idaho:			
Ada	9	124	133
Adams	1,737	4,142	5,879
Bannock	1,155	1,276	2,431
Bear Lake	84	462	546
Bingham	510	1,634	2,144
Blaine	187	631	818
Boise	3,105	4,071	7,176
Bonneville	458	1,431	1,889
Butte	13	85	98
Camas	133	262	395
Canyon	--	99	99
Caribou	1,553	2,207	3,760
Cassia	40	156	196
Clark	320	389	709
Custer	234	373	607
Elmore	666	952	1,618
Franklin	214	559	773
Fremont	741	1,557	2,298
Gem	29	121	150
Gooding	--	24	24
Jefferson	1	56	57
Jerome	--	14	14
Lemhi	247	1,016	1,263
Lincoln	--	8	8
Madison	603	498	1,101
Minidoka	--	11	11
Oneida	44	77	121
Owyhee	144	1,312	1,456
Payette	--	38	38
Power	308	644	952
Teton	46	951	997
Twin Falls	--	86	86
Valley	3,835	6,542	10,377
Washington	737	425	1,162
Total	17,153	32,233	49,386
Total Idaho	61,416	181,848	243,264

Table 73.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by county and ownership class, 1980

County	State	Private	Total
	Thousand board feet - - - International ¼-inch rule - - -		
Northern Idaho:			
Benewah	14,210	68,334	82,544
Bonner	49,005	79,552	128,557
Boundary	22,776	34,482	57,258
Clearwater	61,129	82,229	143,358
Idaho	16,417	43,553	59,970
Kootenai	10,905	78,014	88,919
Latah	10,544	47,846	58,390
Lewis	320	15,404	15,724
Nez Perce	1,451	20,219	21,670
Shoshone	19,160	84,023	103,183
Total	205,917	553,656	759,573
Southern Idaho:			
Ada	42	580	622
Adams	8,697	21,743	30,440
Bannock	5,386	4,267	9,653
Bear Lake	324	1,338	1,662
Bingham	1,955	5,035	6,990
Blaine	964	2,800	3,764
Boise	16,509	21,359	37,868
Bonneville	1,878	4,294	6,172
Butte	68	392	460
Camas	719	1,044	1,763
Canyon	1	418	419
Caribou	6,474	6,308	12,782
Cassia	192	599	791
Clark	1,544	1,419	2,963
Custer	1,183	1,836	3,019
Elmore	3,542	4,512	8,054
Franklin	891	867	1,758
Fremont	3,157	6,018	9,175
Gem	155	595	750
Gooding	1	102	103
Jefferson	2	214	216
Jerome	--	56	56
Lemhi	1,183	4,941	6,124
Lincoln	--	32	32
Madison	2,304	1,996	4,300
Minidoka	--	45	45
Oneida	199	146	345
Owyhee	751	4,607	5,358
Payette	--	165	165
Power	1,553	2,032	3,585
Teton	223	3,115	3,338
Twin Falls	--	271	271
Valley	18,770	34,153	52,923
Washington	3,678	2,098	5,776
Total	82,345	139,397	221,742
Total Idaho	288,262	693,053	981,315

Table 74.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by county and ownership class, 1980

County	State	Private	Total
	- Thousand board feet, Scribner rule -		
Northern Idaho:			
Benewah	12,716	62,121	74,837
Bonner	43,759	71,568	115,327
Boundary	20,420	31,056	51,476
Clearwater	53,791	73,412	127,203
Idaho	14,481	39,454	53,935
Kootenai	9,779	70,886	80,665
Latah	9,253	42,516	51,769
Lewis	282	13,546	13,828
Nez Perce	1,274	17,826	19,100
Shoshone	17,031	76,447	93,478
Total	182,786	498,832	681,618
Southern Idaho:			
Ada	36	516	552
Adams	7,700	19,284	26,984
Bannock	4,662	3,746	8,408
Bear Lake	278	1,181	1,459
Bingham	1,635	4,457	6,092
Blaine	844	2,522	3,366
Boise	14,120	18,968	33,088
Bonneville	1,568	3,767	5,335
Butte	59	350	409
Camas	631	927	1,558
Canyon	1	376	377
Caribou	5,449	5,519	10,968
Cassia	166	533	699
Clark	1,353	1,245	2,598
Custer	1,046	1,654	2,700
Elmore	3,022	4,021	7,043
Franklin	747	756	1,503
Fremont	2,785	5,296	8,081
Gem	132	533	665
Gooding	1	91	92
Jefferson	2	192	194
Jerome	--	48	48
Lemhi	1,046	4,439	5,485
Lincoln	--	28	28
Madison	1,968	1,778	3,746
Minidoka	--	39	39
Oneida	171	130	301
Owyhee	647	4,062	4,709
Payette	--	150	150
Power	1,353	1,781	3,134
Teton	196	2,744	2,940
Twin Falls	--	238	238
Valley	16,742	30,283	47,025
Washington	3,259	1,869	5,128
Total	71,619	123,523	195,142
Total Idaho	254,405	622,355	876,760

Table 75.--Annual mortality of growing stock on State and privately owned timberland in Idaho by county and ownership class, 1980

County	State	Private	Total
	- - - - - Thousand cubic feet - - - - -		
Northern Idaho:			
Benewah	210	2,947	3,157
Bonner	184	1,642	1,826
Boundary	166	544	710
Clearwater	2,112	2,540	4,652
Idaho	496	2,392	2,888
Kootenai	107	2,886	2,993
Latah	383	1,131	1,514
Lewis	11	323	334
Nez Perce	51	420	471
Shoshone	238	3,791	4,029
Total	3,958	18,616	22,574
Southern Idaho:			
Ada	--	13	13
Adams	49	514	563
Bannock	14	251	265
Bear Lake	3	79	82
Bingham	5	278	283
Blaine	4	76	80
Boise	15	521	536
Bonneville	--	270	270
Butte	1	9	10
Camas	1	36	37
Canyon	--	7	7
Caribou	22	426	448
Cassia	3	18	21
Clark	3	79	82
Custer	9	44	53
Elmore	3	112	115
Franklin	2	79	81
Fremont	21	327	348
Gem	--	13	13
Gooding	--	2	2
Jefferson	--	5	5
Jerome	--	--	--
Lemhi	9	128	137
Lincoln	--	--	--
Madison	5	89	94
Minidoka	--	--	--
Oneida	1	6	7
Owyhee	3	248	251
Payette	--	3	3
Power	2	121	123
Teton	6	175	181
Twin Falls	--	10	10
Valley	274	812	1,086
Washington	24	53	77
Total	479	4,804	5,283
Total Idaho	4,437	23,420	27,857

Table 76.--Annual mortality of sawtimber (International ¼-rule) on State and privately owned timberland in Idaho by county and ownership class, 1980

County	State	Private	Total
	Thousand board feet - - - International ¼-inch rule - - -		
Northern Idaho:			
Benewah	1,038	10,582	11,620
Bonner	672	5,980	6,652
Boundary	228	2,099	2,327
Clearwater	12,316	8,943	21,259
Idaho	2,853	9,263	12,116
Kootenai	454	10,640	11,094
Latah	2,161	4,189	6,350
Lewis	57	1,384	1,441
Nez Perce	288	1,766	2,054
Shoshone	1,324	13,599	14,923
Total	21,391	68,445	89,836
Southern Idaho:			
Ada	--	55	55
Adams	266	2,393	2,659
Bannock	31	611	642
Bear Lake	--	150	150
Bingham	--	649	649
Blaine	13	288	301
Boise	59	2,315	2,374
Bonneville	--	545	545
Butte	1	41	42
Camas	2	79	81
Canyon	--	33	33
Caribou	34	744	778
Cassia	8	55	63
Clark	9	189	198
Custer	29	192	221
Elmore	7	401	408
Franklin	2	51	53
Fremont	39	878	917
Gem	--	57	57
Gooding	--	7	7
Jefferson	--	13	13
Jerome	--	--	--
Lemhi	27	479	506
Lincoln	--	--	--
Madison	1	262	263
Minidoka	--	--	--
Oneida	1	7	8
Owyhee	--	619	619
Payette	--	14	14
Power	4	271	275
Teton	21	358	379
Twin Falls	--	15	15
Valley	1,526	3,899	5,425
Washington	130	212	342
Total	2,210	15,882	18,092
Total Idaho	23,601	84,327	107,928

Table 77.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by county and ownership class, 1980

County	State	Private	Total
	- Thousand board feet, Scribner rule -		
Northern Idaho:			
Benewah	903	8,882	9,785
Bonner	563	4,988	5,551
Boundary	189	1,735	1,924
Clearwater	10,700	7,539	18,239
Idaho	2,472	8,107	10,579
Kootenai	385	8,915	9,300
Latah	1,869	3,509	5,378
Lewis	50	1,148	1,198
Nez Perce	250	1,466	1,716
Shoshone	1,163	11,427	12,590
Total	18,544	57,716	76,260
Southern Idaho:			
Ada	--	47	47
Adams	232	2,030	2,262
Bannock	26	510	536
Bear Lake	--	125	125
Bingham	--	546	546
Blaine	10	249	259
Boise	50	1,975	2,025
Bonneville	--	455	455
Butte	1	36	37
Camas	1	68	69
Canyon	--	29	29
Caribou	29	622	651
Cassia	7	46	53
Clark	8	158	166
Custer	24	166	190
Elmore	6	346	352
Franklin	2	43	45
Fremont	33	733	766
Gem	--	50	50
Gooding	--	6	6
Jefferson	--	11	11
Jerome	--	--	--
Lemhi	22	414	436
Lincoln	--	--	--
Madison	1	221	222
Minidoka	--	--	--
Oneida	1	6	7
Owyhee	--	518	518
Payette	--	12	12
Power	3	227	230
Teton	18	300	318
Twin Falls	--	13	13
Valley	1,295	3,311	4,606
Washington	113	183	296
Total	1,882	13,456	15,338
Total Idaho	20,426	71,172	91,598

Table 78.--Annual removals[1] of growing stock on State and privately owned timberland in Idaho by county and ownership class, 1980

County or county groups	State	Private	Total
	- - - - Thousand cubic feet - - - - -		
Northern Idaho:			
Benewah	1,152	14,643	15,795
Bonner	1,199	13,886	15,085
Boundary	1,029	7,341	8,370
Clearwater	14,510	68,727	83,237
Idaho	4,526	9,019	13,545
Kootenai	231	10,130	10,361
Latah	1,321	18,390	19,711
Lewis and Nez Perce	73	4,887	4,960
Shoshone	2,252	26,252	28,504
Total	26,293	173,275	199,568
Southern Idaho:			
Adams	211	7,904	8,115
Boise	860	1,552	2,412
Clark	--	--	--
Cluster and Lemhi	4	41	45
Elmore	181	947	1,128
Fremont	423	52	475
Gem	23	3	26
Teton	--	71	71
Valley	955	14,123	15,078
Other counties[2]	202	94	296
Total	2,859	24,787	27,646
Total Idaho	29,152	198,062	227,214

[1]Includes sawlogs, veneer logs, pulpwood, cedar products, utility poles, house logs, posts and poles, logging residues, and other removals.

[2]Includes Ada, Bannock, Bear Lake, Bingham, Blaine, Bonneville, Butte, Camas, Canyon, Caribou, Cassia, Franklin, Gooding, Jefferson, Jerome, Lincoln, Madison, Minidoka, Oneida, Owyhee, Payette, Power, Twin Falls, and Washington Counties.

Table 79.--Annual removals[1] of sawtimber (International ¼-inch rule) on State and privately owned timberland in Idaho by county and ownership class, 1980

County or county groups	State	Private	Total
	Thousand board feet - - - - - - International ¼-inch rule - - - - - -		
Northern Idaho:			
Benewah	6,671	83,364	90,035
Bonner	6,715	79,660	86,375
Boundary	6,007	42,493	48,500
Clearwater	83,126	395,440	478,566
Idaho	26,017	52,118	78,135
Kootenai	1,290	58,551	59,841
Latah	7,734	105,347	113,081
Lewis and Nez Perce	417	27,907	28,324
Shoshone	12,692	150,249	162,941
Total	150,669	995,129	1,145,798
Southern Idaho:			
Adams	1,142	46,259	47,401
Boise	5,086	9,175	14,261
Clark	--	--	--
Cluster and Lemhi	22	244	266
Elmore	1,071	5,600	6,671
Fremont	2,502	307	2,809
Gem	137	15	152
Teton	--	418	418
Valley	5,608	82,294	87,902
Other counties[2]	1,191	555	1,746
Total	16,759	144,867	161,626
Total Idaho	167,428	1,139,996	1,307,424

[1]Includes sawlogs, veneer logs, pulpwood, cedar products, utility poles, house logs, posts and poles, logging residues, and other removals.

[2]Includes Ada, Bannock, Bear Lake, Bingham, Blaine, Bonneville, Butte, Camas, Canyon, Caribou, Cassia, Franklin, Gooding, Jefferson, Jerome, Lincoln, Madison, Minidoka, Oneida, Owyhee, Payette, Power, Twin Falls, and Washington Counties.

Table 80.--Annual removals[1] of sawtimber (Scribner rule) on State and privately owned timberland in Idaho by county and ownership class, 1980

County or county groups	State	Private	Total
	- - Thousand board feet, Scibner rule - -		
Northern Idaho:			
Benewah	5,373	69,410	74,783
Bonner	5,724	66,248	71,972
Boundary	4,893	35,017	39,910
Clearwater	69,288	328,149	397,437
Idaho	21,616	43,045	64,661
Kootenai	1,103	48,351	49,454
Latah	6,259	87,743	94,002
Lewis and Nez Perce	349	23,332	23,681
Shoshone	10,759	125,356	136,115
Total	125,364	826,651	952,015
Southern Idaho:			
Adams	992	37,739	38,731
Boise	4,107	7,410	11,517
Clark	--	--	--
Custer and Lemhi	17	194	211
Elmore	865	4,523	5,388
Fremont	2,022	247	2,269
Gem	110	15	125
Teton	--	339	339
Valley	4,551	67,400	71,951
Other counties[2]	962	451	1,413
Total	13,626	118,318	131,944
Total Idaho	138,990	944,969	1,083,959

[1]Includes sawlogs, veneer logs, pulpwood, cedar products, utility poles, house logs, posts and poles, logging residues, and other removals.

[2]Includes Ada, Bannock, Bear Lake, Bingham, Blaine, Bonneville, Butte, Camas, Canyon, Caribou, Cassia, Franklin, Gooding, Jefferson, Jerome, Lincoln, Madison, Minidoka, Oneida, Owyhee, Payette, Power, Twin Falls, and Washington Counties.

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Presents land area, timberland area, timber volume, and components of change for the State and private forest lands in Idaho.

KEYWORDS: forest survey, timberland, inventory volume

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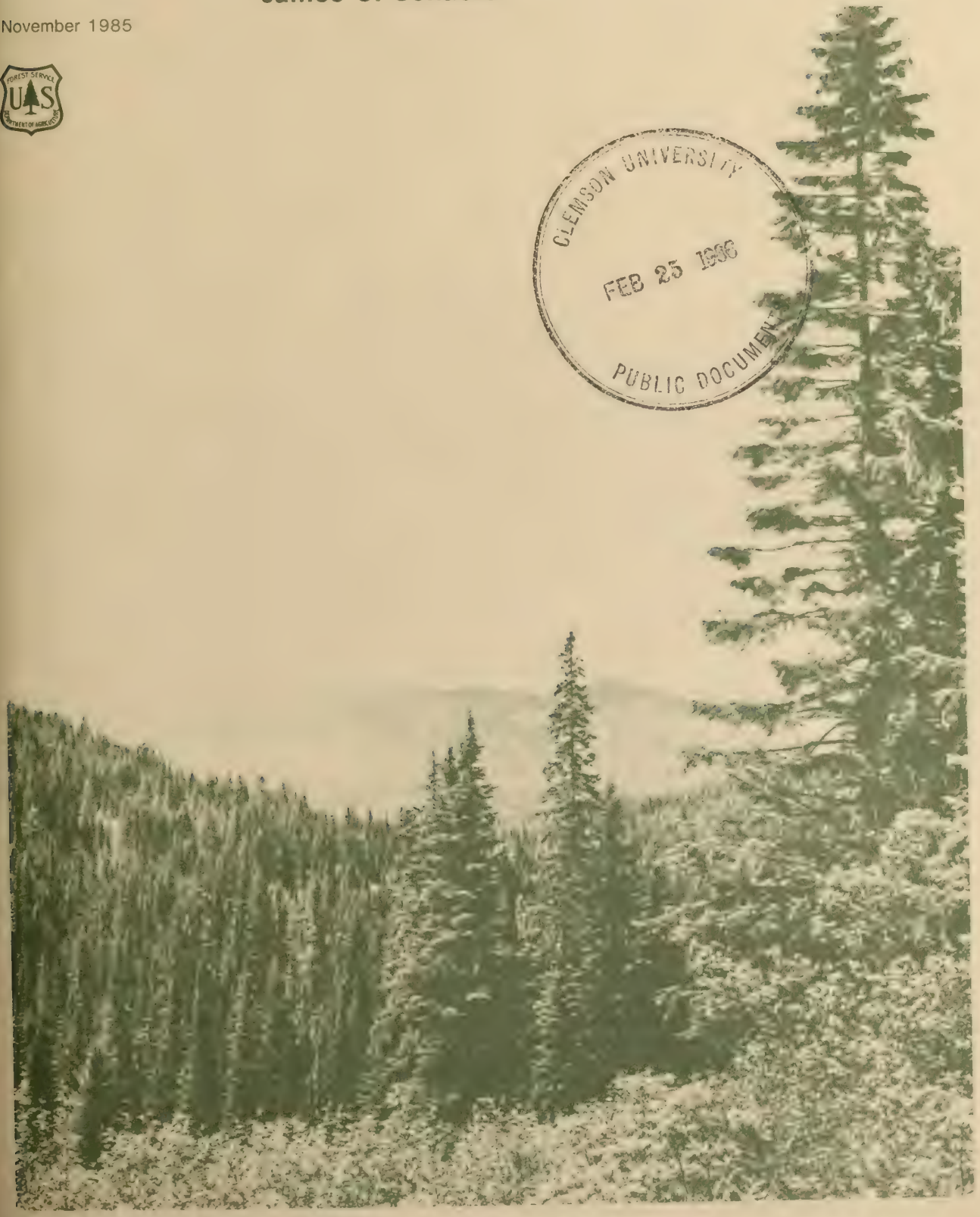

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PREFACE

Forest Survey is a continuing nationwide undertaking conducted by the USDA Forest Service with the primary objective of providing an assessment of the renewable resources on the Nation's forest and range lands. This requires periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

The Intermountain Research Station with headquarters in Ogden, UT, administers the forest resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, Wyoming, western South Dakota, western Texas, and Oklahoma's Panhandle. These inventories provide information on the extent and condition of State and privately owned forest lands, volume of timber, and rates of timber growth and mortality. These data, when combined with similar information for Federal lands, provide a basis for forest policies and programs and for the orderly development and use of the resources.

ACKNOWLEDGMENTS

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RESEARCH SUMMARY

Presents highlights of the forest resources of Montana as of 1980. Describes the forest resources, their extent, condition, and location, and discusses levels of some nontimber use of forest lands. Include statistical tables: area by land classes, ownership, growing stock and sawtimber volumes, growth, morta ity, roundwood products output, utilization, and residues.

HIGHLIGHTS

Area

- Total land area in Montana is 93,048.4 thousand acres.
- Forests occupy 20,226 thousand acres.
- Area of commercial timberland is 13,571.3 thousand acres or 67 percent of the total forest land.
- Farmer and other private lands account for 3,048.9 thousand acres or 22 percent of the commercial timberland.
- National Forest lands account for 60 percent of commercial timberland.
- Forest industry has 1,601.3 thousand acres (12 percent), and other publics have 759.3 thousand acr (6 percent) of the commercial timberland.
- Douglas-fir is the predominant forest type, occupyin slightly over a third of the commercial timberland.
- Douglas-fir, lodgepole pine, and ponderosa pine combined occupy 76 percent of the commercial timberland.
- These highlights do not include information on 2.9 million acres of Bureau of Land Management (BLM) land and 5.2 million acres of Indian land, a component of other private land.
- Of the commercial timberland, 40 percent is capable of producing at least 85 cubic feet of wood per acre per year.
- On the average, commercial timberland in Montana i currently producing 57 percent of its annual potentia of 78 cubic feet per acre.
- Only 3 percent of the commercial timber on State and private land is old growth.
- Stands that are fully stocked with desirable trees occupy only about 20 percent of the commercial timberland on State and private land.

Inventory

- Including all ownerships, growing stock volume amounts to 26.2 billion cubic feet, and sawtimber volume totals 88.3 billion board feet (International).
- On State and private land, growing stock volume amounts to about 8 billion cubic feet, and sawtimber volume totals nearly 28 billion board feet (International).
- The most dominant single species—Douglas-fir—constitutes 35 percent of the cubic foot and 37 percent of the board foot volume on State and private land.
- Forest industry controls 42 percent of the growing stock and 45 percent of the sawtimber volumes on privately owned land.
- Of the sawtimber on commercial timberland, 60 percent is in trees less than 17 inches diameter at breast height.
- Net annual growth on commercial timberland in Montana was 490 million cubic feet in 1980.
- On private land in 1980, net annual growth totaled 142 million cubic feet or about a third of the total net growth of the State.
- Annual mortality of 107.6 million cubic feet in 1980 was about 18 percent of the gross annual growth in Montana.

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Montana's Forests

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INTRODUCTION

Although the forests were an integral part of Montana's settlement and early economic development, almost nothing was known about them until much later. Forest reserves had been established in the early 1900's and some National Forests proclaimed. Administration of Federal forest land was almost entirely a matter of maintenance, protection, surveying, and mapping.

In 1928 the McSweeney-McNary Act authorized and mandated a forest survey of forested lands in the United States. The first forest inventory of Montana began in 1934. Progress was slow. By the start of World War II only that part of the State west of the Continental Divide and four counties east of the Divide had been inventoried. Field work resumed in 1947 and the survey was completed in 1949.

The results of that survey were reported by Hutchison and Kemp (1952). The keen interest in the extent of the timber supply related to the expected postwar demands for timber products.

Between 1953 and 1958 the forests west of the Continental Divide were reinventoried. But it was not until 1966 that the "east side" forests were looked at again. Pissot and Hanson (1963) reported on the "west side" forest inventory. The general concerns were the same—adequacy of timber supplies. There have been other reports and summaries of the various facets of Montana's forest economy, and all were concerned primarily with commercial output of wood products.

But in the early 1970's people began viewing Montana's forests as a complex of several resources having exceptional value in their own right. In 1975, Schweitzer and others updated a previous report and looked at the future economic prospects for the timber resource and industry. Also, they looked at the environmental aspects of both timber and nontimber use of the forests.

This current report presents the basic findings of the third forest inventory of State and privately owned lands in Montana. It contains basic data on forest area, timber volume, growth, and mortality statistics, and discusses some current situations and opportunities for increasing future timber supplies.

Comparing statistics from successive forest inventories is always tempting. Not particularly wise, but tempting. In this case, one has to realize more than 40 years have passed since the first inventory west of the Divide was completed. Changes in inventory techniques (sampling, design and intensity, measurement equipment) and changes in definitions and standards can lead such comparisons to some rather flimsy and unfounded conclusions.

But more importantly, at the time this report was prepared, there were no data for some 5.2 million acres of Indian lands (a component of "other private" owner groups) and about 2.9 million acres of Bureau of Land Management (BLM) lands, containing some 420 thousand acres of timberland in western Montana. However, data for the approximately 5.3 million acres of land

administered by BLM in eastern Montana, containing 67,600 acres of timberland, are included under the "other public" ownership groups.

The total area of Montana is 94.109 million acres, of which 93 million is land and 1.1 million water (table 1). In 1980 about 33.2 million acres (roughly 36 percent of the land area) was publicly owned.

Table 1.--Total land and water area in Montana by ownership class, 1980

Ownership class	Area
	Thousand acres
Land:	
National Forest	16,752.7
National Parks[1]	1,273.1
Other public:	
Bureau of Land Management	8,148.7
Miscellaneous Federal	1,319.0
State	5,563.3
County and municipal	114.8
Private:	
Forest industry[2]	1,812.4
Farmer and other private	58,064.4
Total land area	93,048.4
Census water	1,060.8
Total land and water[3]	94,109.2

[1]Not included with miscellaneous Federal, a component of other public, for purposes of clarity.

[2]Forest industry is a component of private ownership, but because of its importance to the Montana timber supply situation, area and statistics for forest industry are shown separately in this and other tables dealing with owner groups in this report.

[3]U.S. Bureau of the Census, land and water area of the United States, 1980.

BRIEFLY HISTORICAL

When the Louisiana Purchase was consummated with France in 1803, few people knew much about the Northwest Territory. But fur trappers working for companies operating in Canada had filtered down and made deals with the Indians in the mid-1700's. Some trading posts had been set up at the mouth of the Columbia River.

In 1804 President Thomas Jefferson thought it a good idea to find the rumored waterway to the West Coast. If the waterway did exist, it would provide a great opportunity to expand trade, especially furs, and give the United States a better international image, which it needed.

Jefferson sent William Clark and Meriwether Lewis in search of the Northwest Passage. The details of their expedition are well documented. They did not find the great waterway, but they did make it to the mouth of the Columbia and over 2 years later were back in St. Louis. During their trek they spent

some 170 days in what is now Montana, documenting and mapping what they saw. As the Lewis and Clark journals were published, settlers began their own movement west—up the Missouri River from St. Louis or overland into the Northwest—to make a new life in the vastness of the "Big Sky." The attraction was the green grass, farmland, abundant water, forests, and game.

As more settlers came, forts were built for protection from the Indians, and missions for protection from everything else. St. Mary's Mission, established at Stevensville in 1841, was the first permanent white settlement in Montana.

By 1842 some Jesuit priests at the mission thought a sawmill would answer a need. They pounded flat the rim off a wagon wheel, cut teeth in it, and made a pit-saw setup.

The valleys in western Montana continued to accommodate the trickle of pilgrims from the East. The discovery of gold near Bannock in 1862 drew a big crowd. As the homesteaders followed the prospectors into Montana's valleys, the need for lumber and structural timbers grew. By 1865 Montana had become a territory and the forests a prime resource for economic development, with both hand-powered and water-powered sawmills serving the communities' and miners' needs locally. Soon steam-driven mills were in place, and Montana's forest products industry began.

THE FORESTS

How Much Is There?

Over a fifth of the land area is forest.

Montana's forests cover some 20.2 million acres, roughly 22 percent of the land area. Nearly 16 million acres are classed as productive timberland. The remainder is "other" forest land considered unproductive from the standpoint of growing and harvesting roundwood products usually associated with forest industries (table 2).

Table 2.--Land area in Montana by land class, 1980

Land class	Total
	Thousand acres
Commercial timberland	13,571.3
Productive deferred	708.7
Productive reserved	1,561.7
Other forest land:	
Unproductive reserved	1,014.6
Unproductive nonreserved	3,369.7
Total forest land	20,226.0
Nonforest land	63,452.8
Total[1]	83,678.8

[1]This report includes data for only 5.3 million acres of land (containing 67,600 acres of timberland) administered by BLM in eastern Montana. At the time this report was prepared there were no data available for the 2.9 million acres of BLM land (including 420,000 acres of timberland) in western Montana, or for any of the 5.2 million acres of Indian lands, a component of "other private" ownership category.

Some 2 million acres of public land is reserved from cutting.

About 2.3 million acres of productive timberland in public ownership is currently reserved from timber harvesting. Roughly 1.6 million acres have been set aside by administrative designation or through statutes. Much of the area is in the National Wilderness Preservation System. The remainder is in a "deferred" category; this means the areas are under study for possible inclusion into the wilderness system. (Definitions for other terms used in this report are in appendix I, "Terminology.")

Over 4 million acres of forest are unsuited for wood production.

The "other" forest land is considered unproductive either because of the tree species making up the stands or because of adverse site conditions that preclude any reasonable growth rate. In effect, you can't make a dollar trying to grow timber on it. That is not to say such land has no value for wildlife, grazing domestic livestock, watershed protection, or even some wood products.

Trends in Area

Early settlement and development exploited the timber resource.

Historical trends in forest area are difficult to track because of lack of good early historical data since Lewis and Clark trekked across Montana and back in the early 1800's. But we do know that the first non-Indian settlers cut trees and cleared land. Then the discovery of gold in the early 1860's created an almost instant demand for wood for the influx of miners, settlers, and attendant industries. Along with the forest land cleared for settlement, many forests were exploited for construction material, mine timbers, railroad ties, and charcoaling for ore reduction. Most areas cleared for these uses have reverted back to forest.

The commercial timberland base is now 14 million acres.

What has reduced is the area of productive forest land available for growing and harvesting industrial wood products—the "commercial timberland" base. In 1952 the estimated area of such land was about 16.7 million acres. It is currently estimated to be about 14.4 million acres (Green and Van Hooser 1983). A major reason for the decline—inclusion of publicly owned productive forest land into the Wilderness System or withdrawal in favor of uses that would preclude harvesting.

A more recent factor, and one that will continue into the future, is the subdivision of privately owned productive timberland into small parcels for home sites.

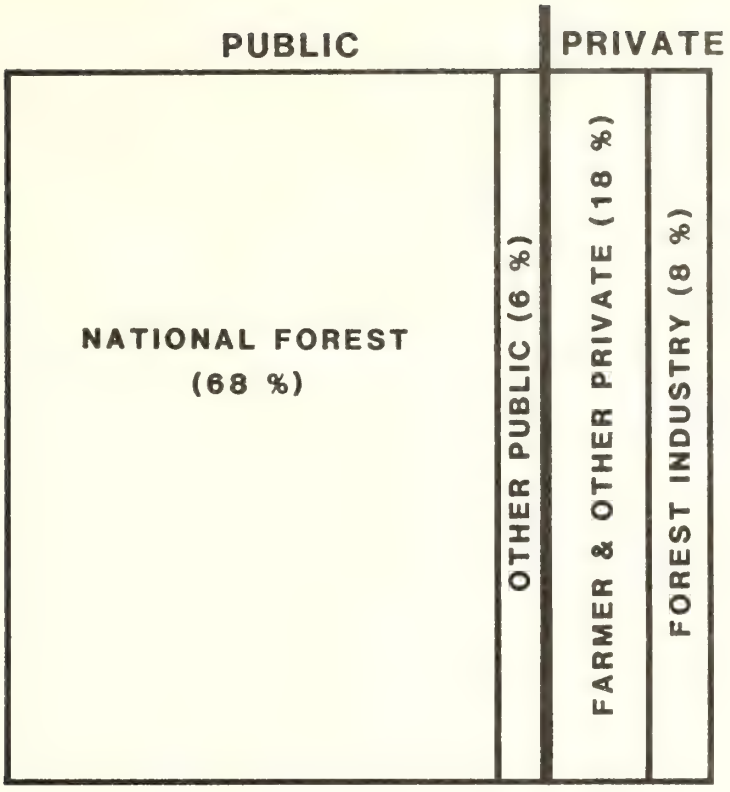
The future? It is doubtful the total area of forest land will change significantly. However, the allocation of forest land for various uses may change.

The Forest Owners

Three-fourths of the forest land is publicly owned . . .

Nearly three-fourths of Montana's forest land is publicly owned. Most of it is under the administration of Federal agencies. The Forest Service has the most. Its 13.8 million acres is 68 percent of the total and 93 percent of the publicly administered forest land.

Owner group	Area *Thousand acres*	Percent of total
Public		
Forest Service	13,817.2	68
Other public	1,053.4	6
Total	14,870.6	74
Private	5,355.4	26
Total	20,226.0	100



and most of it is on National Forests.

Although the numbers change, the same general ownership pattern holds for the forest land classed as commercial timberland (table 3). Sixty-six percent is under public administration, mostly Federal.

Farmers and other private owners have 70 percent of the privately owned forest land.

Of the remainder under private ownerships (34 percent), over one-third is owned by forest industries, and almost two-thirds is owned by farmers or ranchers.

The significance of ownership of these lands lies in the rules and regulations governing their use and management. Private land owners can do almost anything they want on their own land. But all U.S. citizens, regardless of where they live, may have, if they choose, a say in how Montana's federally administered forests are used. Such public input to management planning affects the output of all resource uses of these important lands.

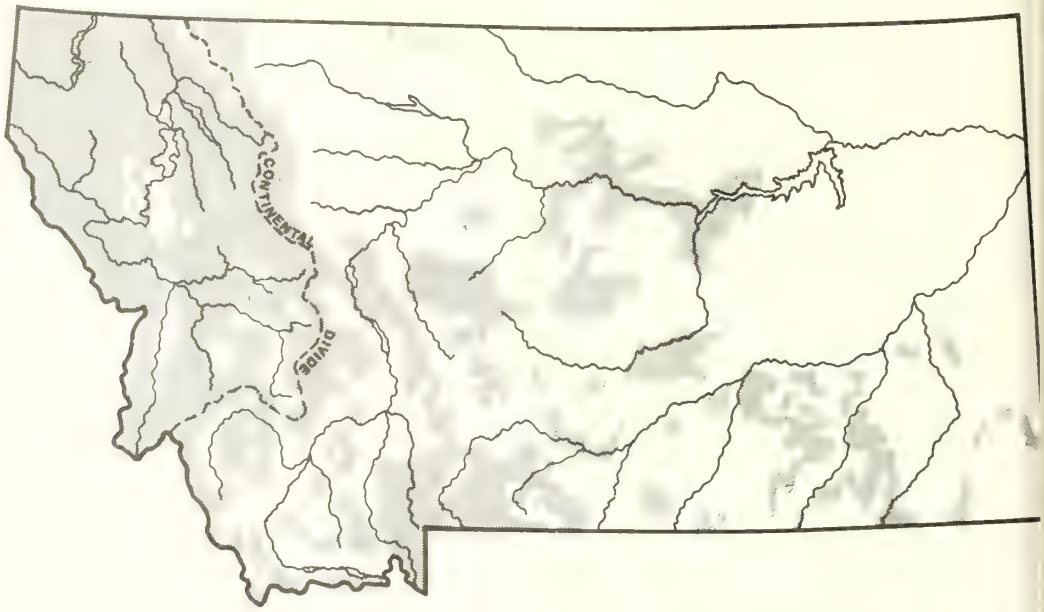
Table 3.--Area of forest land in Montana by major land class and ownership class, 1980

Land class	Ownership class				Total
	National Forest	Other public	Forest industry	Farmer and other private	
	Thousand acres				
Commercial timberland	8,161.8	759.3	1,601.3	3,048.9	13,571.3
Productive deferred	708.7	--	--	--	708.7
Productive reserved	1,439.9	112.8	1.8	7.2	1,561.7
Other forest land:					
Unproductive reserved	981.8	31.6	0.7	0.5	1,014.6
Unproductive nonreserved	2,525.0	149.7	12.2	682.8	3,369.7
Total forest land	13,817.2	1,053.4	1,616.0	3,739.4	20,226.0

Nature of the Forests

The forests consist of 27 species.

Montana forests contain 27 species of trees—17 conifers and 10 hardwoods (see appendix V for list). These species may grow singly in nearly pure stands or in combination with several other species. How and where they grow depends on such things as elevation, available moisture, and soil characteristics. As a general rule, where there are mountains there are forests. The larger, wide, low-elevation valleys generally are not forested except for hardwoods growing along the streams and rivers.



Western Montana is the most heavily forested region.

The most heavily forested part of Montana is west of the Continental Divide where the high mountain ranges trigger the release of large amounts of moisture from the westerly air flows coming from the Pacific Ocean (Arno 1979). There the nature of the forest changes quite noticeably over relatively short distances because the habitat conditions change rather rapidly with respect to elevation and moisture. East of the Divide the climate is much drier. Consequently, the forests are restricted to higher elevations, and so exist in scattered patches.

Forest ecosystems continually change.

Vegetation is the most recognizable feature of an ecosystem. And whatever vegetation exists at any place is a function of climate and landform (Bailey 1976; 1978). Ecosystems continue to change over long periods, progressing to a point where the system is in balance and the vegetation perpetuates itself without further change (climax vegetation). Some force from outside a climax state system, such as fire, a Mount St. Helens eruption, or human activity, that eliminates the existing vegetation, restarts the successional process of advancement toward the climax vegetation.

Habitat conditions dictate where species grow.

The major tree species grow over a range of habitat conditions, and most find some range of conditions in which they would become the climax vegetation type (fig. 1).

An inherent problem of describing the vegetation of any specific geographical area is classifying or categorizing into similar ecological units. Categories can be broad or specific depending on the needs of the user. It is through such categories that distinctions between one vegetational situation and another can be made.

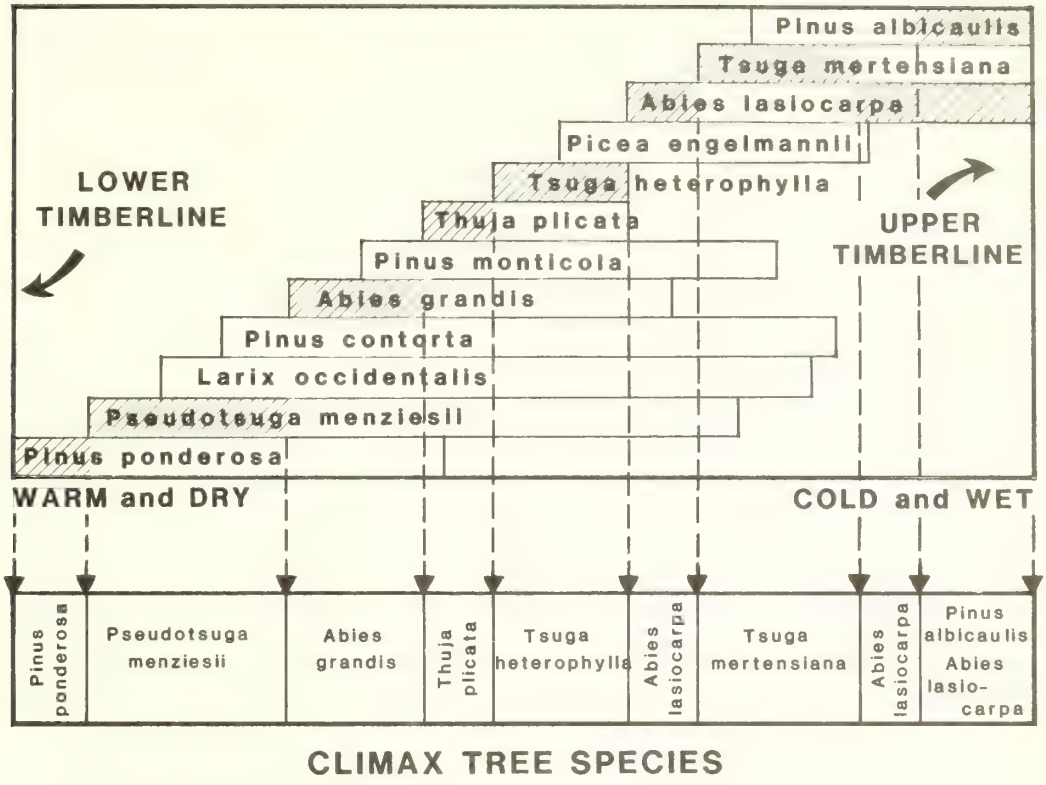


Figure 1.—Coniferous trees in Montana arranged vertically to show the usual order in which the species are encountered with increasing altitude. The horizontal bars designate upper and lower limits of the species relative to the climatic gradient. The shaded area indicates that portion of a species' altitudinal range in which it can maintain a self-reproducing population in the face of intense competition (modified from Daubenmire by Pfister 1976).

The five major forest zones in Montana . . .

Five major, and rather general, climax forest zones have been identified for Montana (fig. 2). In northwestern Montana the zone elevations are somewhat lower than those shown. In the southern and eastern parts of the State they would be somewhat higher.

are made up of six major coniferous forest types.

Within the five forest zones in Montana, there are six major coniferous forest ecosystems of interest in terms of timber production: larch, lodgepole pine, ponderosa pine, Douglas-fir, white pine, and spruce-fir.

In the brief descriptions of the Montana forests that follow, the categories are at the "forest type" level. They are identified based on the dominant role of their namesake species within the ecosystem.

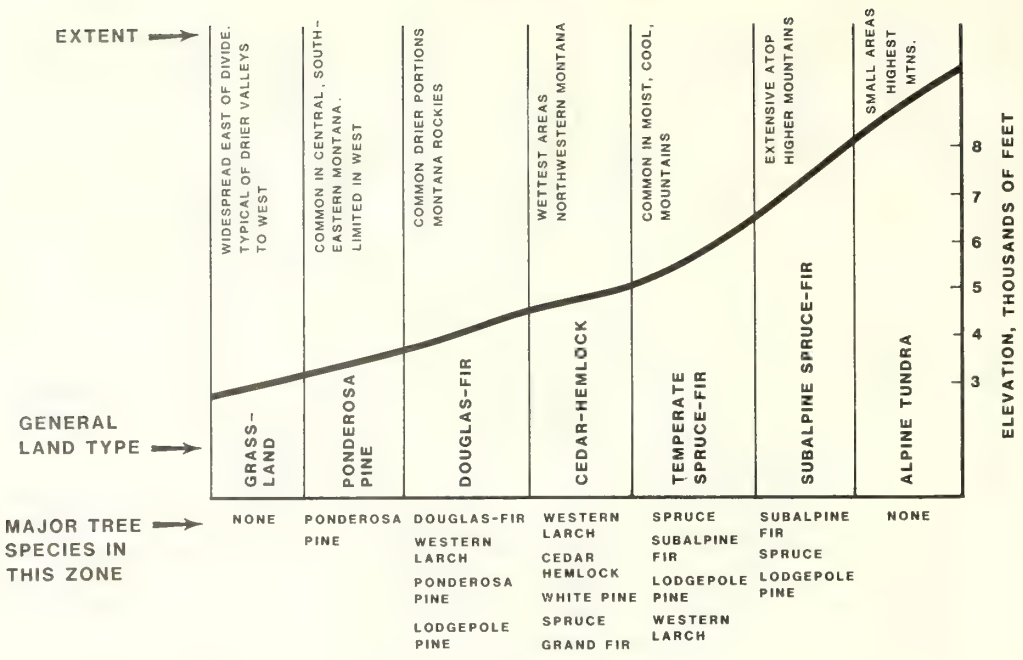


Figure 2.—Forest zones of Montana (Schwietzer and others 1975).

Nearly half the Nation's western larch is in Montana.

Western Larch.—A total of 637,000 acres, or 44 percent, of the western larch forest type in the United States, is in Montana. The larch type occurs almost totally west of the Continental Divide in Montana and is found in the Douglas-fir, cedar-hemlock, and temperate fir-spruce forest zones (fig. 2). Western larch (*Larix occidentalis* Nutt.) is a deciduous conifer and is a subclimax species often maintained by fire. Western larch is found on a wide range of sites, growing in association with ponderosa pine (*Pinus ponderosa* Dougl. ex Laws.) on dry, warm sites, and with grand fir (*Abies grandis* [Dougl. ex D. Don] Lindl.), western hemlock (*Tsuga heterophylla* [Raf.] Sarg.), and western white pine (*Pinus monticola* Dougl. ex D. Don) on more cool and moist sites. It grows at higher elevations with Engelmann spruce (*Picea engelmannii* Parry ex Engelm.) and subalpine fir (*Abies lasiocarpa* [Hook.] Nutt.). Western larch is one of the larger and better timber species in Montana, growing tall, straight, and clear.

Subalpine larch (*Larix lyallii* Parl.) is a rather rare tree seen up close by few people. It grows at high elevations in the subalpine fir-spruce zone, usually associated with subalpine fir and whitebark pine. It tends to be shorter and grow in a more scrubby form than western larch.

Lodgepole pine is one of the most abundant.

Lodgepole Pine.—Lodgepole pine (*Pinus contorta* var. *latifolia* Engelm.) has the widest range of any species in Montana and often consists of pure or nearly pure, dense stands at midelevations. Stands having thousands or tens of thousands of stems per acre are not uncommon. There are about 3.9 million acres of it in Montana, divided about equally east and west of the Continental Divide. Lodgepole pine is typically a seral species, frequently replaced through succession by other conifers such as Douglas-fir (*Pseudotsuga menziesii* var. *glauca* [Beissn.] Franco) and subalpine fir, and is found within several of the forest zones (fig. 2). In some cases, however, pure stands of lodgepole pine take on the appearance of a climax type, with little or no replacement by other species. This is especially true following fires in other ecosystems where it makes up a substantial portion of the stand and provides the major seed source for natural regeneration.

Much of the ponderosa pine occurs west of the Continental Divide.

Ponderosa Pine.—One of the most important timber trees in the United States and an important forest type in Montana is ponderosa pine. Of the 2.6 million acres of ponderosa pine in Montana, 85 percent occurs west of the Continental Divide and is a different variety (*P. ponderosa* Dougl. ex Laws. var. *ponderosa*) than that east of the Divide. In the east it is the shorter growth form, *P. ponderosa* var. *scopulorum* Engelm. In much of the eastern part of the State, ponderosa is the only upland tree species and occurs largely as islands in the plains. The ponderosa pine type in western Montana can be found in more or less pure stands on drier sites, or mixed with other species on sites with more moisture, principally in the Douglas-fir forest zone.

Douglas-fir is the number one timber species.

Douglas-fir.—This type occupies the area immediately above the ponderosa pine zone and below the cedar-hemlock zone. There are 4.9 million acres of this type in Montana, over half of which occur west of the Continental Divide. Few if any other important American tree species grow under more diverse climatic conditions. It can be found in pure stands as a climax species or in a codominant situation with grand fir, Engelmann spruce, subalpine fir, or western larch. In terms of timber production, it is number one in Montana.

Western white pine is found on some of the most productive land.

Western White Pine.—The western white pine type is centered in northern Idaho with some extension into the western edge of Montana. This seral type is located on midelevation sites, and usually contains a general mixture of western redcedar (*Thuja plicata* Donn ex D. Don), western hemlock, grand fir, Douglas-fir, and western larch, with ponderosa pine at lower elevations and Engelmann spruce at higher elevations. Western white pine and its associates occupy some of the most productive forest land in the State.

The fir-spruce type is found at higher elevations.

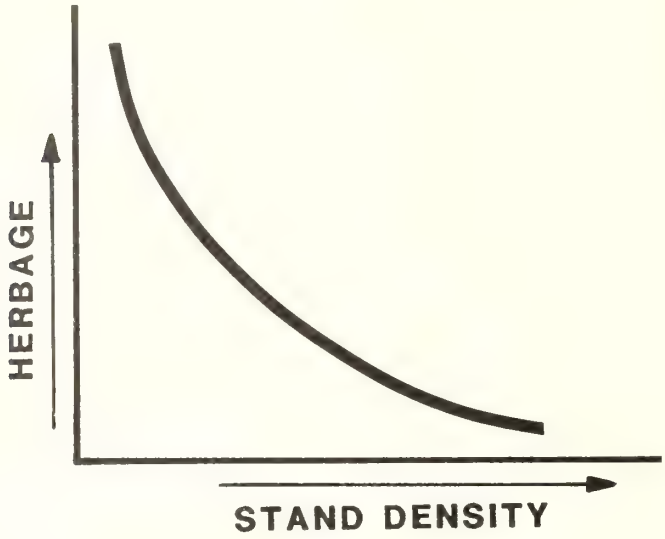
Fir-Spruce.—The fir-spruce forest type occupies about 1.2 million acres in Montana at higher elevations where temperatures are cool and moisture abundant. Grand fir, subalpine fir, and Engelmann spruce are the major species. Some of the more common associates in the Northern Rocky Mountains are larch, aspen (*Populus tremuloides* Michx.), lodgepole pine, and Douglas-fir. Mountain hemlock (*Tsuga mertensiana* [Bong.] Carr) is found in association with whitebark pine (*Pinus albicaulis* Engelm.), subalpine fir, and Engelmann spruce at higher altitudes, going to timberline.

Hardwoods of the East and West meet in eastern Montana.

Hardwoods.—The hardwoods of the East and West meet in eastern Montana. Aspen and cottonwood (*Populus* L.), boxelder (*Acer negundo* L.), bur oak (*Quercus macrocarpa* Michx.), green ash (*Fraxinus pennsylvanica* Marsh.), willow (*Salix* L.), birch (*Betula* L.), and elm (*Ulmus* L.) are all native to the State. Only cottonwood occurs in sufficient volume to be important. Three-fourths of Montana's cottonwood is east of the Continental Divide. This type group occurs mostly as scattered patches and stringers along streams and rivers, with the largest quantities along major rivers such as the Milk and Yellowstone.

A Grazing Resource

As in other Rocky Mountain States, grazing has always been an important part of the forest scene in Montana. As the seasons change the grazing moves from low-elevation lands to higher ground and then back. The grazing done on forested land is centered on the openings in the forest and the more lightly stocked stands because that is where the forage is. As a general rule, the more dense the stand the less forage is available.



Available forage is related to stand characteristics and topography.

On a more practical note, topography and stand density can preclude grazing even if there is forage available.

Complete grazing statistics are rather difficult to come by. But grazing data for the National Forests for 1977 and 1981 give some indication of the level and recent trends in the activity:

	1977		1981	
	No. animals	AUM's[1]	No. animals	AUM's
Cattle	128,593	521,535	121,945	546,284
Horses and burros	14,039	11,176	17,393	13,746
Wild horses	—	115	—	29
Sheep and goats	37,822	19,380	37,901	21,998
Total	180,454	552,206	177,239	582,057

Recent trends show fewer animals grazing for longer periods.

These data indicate a substantial increase in animal unit month (AUM) use but a decrease in the number of animals grazed. The decrease in the number of cattle grazed was offset somewhat by the increase in horses.

Land development is impacting availability of forested range.

Just as with timber supplies, cattle grazing in the forest seems to be influenced by changes in forest use. For example, the development of forest land for summer houses or "ranchettes" displaces the opportunity for grazing cattle. In parts of Montana this has been happening for the past decade or longer. In areas such as the Bitterroot Valley, cattle are out but horses are acceptable.

Sheep, on the other hand, having somewhat different range requirements, have been grazed in about the same numbers but over a longer season.

[1]An AUM (animal unit month) is the amount of forage required by a 1,000-pound cow or its equivalent in 1 month (Ford-Robertson 1971).

A Recreation Resource

Outdoor recreation is big business.

Outdoor recreation is a big part of the lives of many Montanans and a primary attraction for several million tourists annually. In 1980 nonresident tourists alone spent over $250 million, most of which was recreation related (Oblinger-McCaleb Architects 1980). The center attractions for such recreation are the forest land and its streams and lakes.

Montana ranked eighth in the nation for recreation on National Forests.

The importance of a resource is usually gauged by some measure of its use. Unfortunately, recreation use of forest land is at best difficult to measure precisely. But reported estimates of such activities on the National Forests do give an indication of the extent and kind of activities people engage in.

In 1978 Montana's National Forests ranked eighth in the nation for recreational use with nearly 8.3 million recreation visitor days (RVD's). Not surprisingly, camping, hunting, and fishing were collectively the favored activities (table 4). Many of the RVD's were generated by nonresident tourists. By 1981 the total recreation on National Forests reached 9.5 million RVD's, with the largest increase in dispersed areas (USDA Forest Service 1981). Much of the backcountry recreation takes place in the 3.1 million acres of land in the National Wilderness Preservation System.

Table 4.--Summary of National Forest recreational use in Montana, 1978 (thousand recreation visitor days [RVD's])

Activity	RVD's	Total RVD's
Camping	1,704.0	
Fishing	732.7	3,147.1
Hunting	710.4	
Recreational travel	2,258.2	
Picnicking	337.9	2,733.8
Gathering forest products	137.7	
Boating	164.5	
Other water sports	100.5	265.0
Hiking and mountain climbing	379.2	
Horseback riding	229.3	608.5
Winter sports		486.6
Other[1]		1,029.2
Total		8,270.2

[1]Other recreation activities include games and team sports, resort use, organization camp use, recreation residence use, nature study, viewing scenic areas, and visitor information services (exhibits, talks, and so forth).

Much of the attraction of Montana's forest is the abundance of wildlife. About 540 species of animals, birds, fish, reptiles, and amphibians rely on the forest land for their survival.

Over 500 species of "critters" rely on Montana's forest.

Probably the most well known—and most feared—is the grizzly bear. Jeremiah Johnson's legendary encounters notwithstanding, bare-handed combat with a "griz" in a wilderness area is not high on anyone's "wish-list" of outdoor recreation opportunities. The few grizzly bears that remain are found mostly in and around Glacier and Yellowstone National Parks but may be found in other remote areas. Their numbers are estimated to be roughly 1,000. In 1975 they were put on the "threatened species" list, requiring special land management considerations for their protection.

Montana's wildlife is an integral part of its recreation industry. No recent State-wide data are available, but in 1975 sportsmen spent approximately 5.2

Hunting game animals is a major recreational activity.

million visitor days hunting, fishing, or trapping. Assuming the average daily expenditure was $20, over $100 million was dropped by sportsmen into the State's economy that year. It is no doubt much greater today.

A convenient way to look at the main species is to categorize them:

Big game	Small game	Nongame
Mule deer	Native mountain grouse:	Mammals
White-tailed deer	Blue	Birds
Elk	Ruffed	Reptiles
Antelope	Spruce	Endangered species:
Others:	Native prairie grouse:	Bald eagle
Moose	Sage	Peregrine falcon
Big horn sheep	Sharptailed	Gray wolf
Mountain goats	Introduced highland game birds:	Blackfooted ferret
Black bear	Pheasant	
Grizzly bear	Chukar	
Cougar	Hungarian partridge	
Bison	Turkey	
	Migratory game birds:	
	Ducks	
	Geese	
	Other furbearers	

Populations fluctuate annually . . .

Populations of these species fluctuate from year to year depending on habitat conditions, severity of winter, hunting pressure and success, and so forth. No one knows how many animals of any species really exist in the State. And for most species there are both resident and migratory populations. However, some estimates indicate relative abundance of major big game species:

but deer are the most populous.

Mule and white-tailed deer	226,000
Elk	100,000
Big horn	3,000
Pronghorn	86,000
Bison	500
Black bear (on National Forests only)	15,000
Grizzly bear	± 1,000

A Timber Resource

Over 13 million acres of land are suitable for timber growing and harvesting.

Of the more than 20 million acres of forest land considered in this report, about 13.6 million were classed as commercial timberland in 1980:

	Million acres
Forest land	
Commercial timberland	13.6
Productive reserved	1.5
Deferred	.7
Unproductive	4.4
Total	20.2

Commercial timberland is that part of the forest land base from which current and future supplies of industrial wood can reliably be expected. But the "house" of commercial timberland has two masters—suitability and availability.

Suitability has to do with factors of productivity and the ability of the land to withstand the physical disturbance attendant to management and harvesting activities. Availability pertains to the relative importance of timber in relation to other forest uses and the difficulty of effecting management activities and harvest.

But some of the wood is not available for harvesting.

Of the two factors, availability is the more fickle. Administrative or legislative decisions or both can make more or less forest land available for wood harvesting. Logging technology and elevated timber prices can make more wood available from forests that now are unavailable because of economic and environmental considerations. And then there is the perpetual question about the intentions of nonindustrial private owners. At what price will they harvest trees, if at all? Unfortunately, present timber inventories do not take into account all the factors affecting availability of the land for supplying timber or the availability for harvest of the wood that is grown.

Wilderness and other nontimber uses have reduced the commercial timberland base.

Since 1970 the area classed as commercial timberland has dropped by 1.4 million acres. Nearly half of it was within areas added to the Wilderness Preservation System. Most of the remainder was reclassified as unproductive forest. And with Congress considering additional areas for wilderness, further reductions in the commercial timberland area may take place. However, much of the area still under study is in the high country and not of much importance for timber production.

Shifting ownerships and the resulting rarity of long-range plans make a guessing game of the availability of productive forests on nonindustrial privately owned land. The accelerated subdivision of forest land into summer house lots and "ranchettes" makes the availability of timber from these lands highly questionable. Increasing numbers of owners are holding the properties for purposes that exclude any major timber harvesting.

About 40 percent of Montana's forest land can produce over 85 cubic feet per acre per year.

How Productive Is the Forest Land?—Montana has some of the most productive forest land in the Nation, particularly west of the Continental Divide. More than 40 percent of the forest land has the potential to produce over 85 cubic feet per acre per year:

Productivity class *Ft^3/acre/year*	Thousands of Acres	Percent of total
20— 49	3,357.8	24.7
50— 84	4,702.0	34.6
85—119	4,032.2	29.7
120—164	1,426.1	10.5
165+	53.2	0.5
Total	13,571.3	100

The lands with the highest average biological potential productivity are on the National Forests and lands owned by forest industries:

Owners group	Potential productivity *Ft^3/acre/year*
National Forests	88.0
Forest industry	71.6
Other private	56.0
Other public	65.2
All owners	77.6

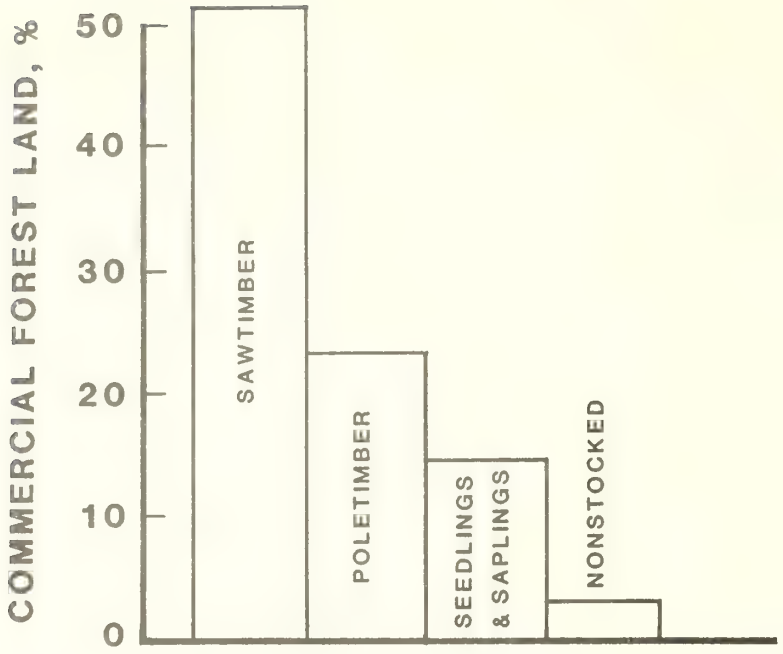
Douglas-fir and lodgepole pine make up nearly two-thirds of the forest.

What Is It Like?—About 64 percent of Montana's commercial timberland is made up of two forest types: Douglas-fir at nearly 4.9 million acres and lodgepole pine at nearly 3.9 million acres. Tossing in the ponderosa pine and fir-spruce types brings the total to 93 percent of the timberland area.

And a bit of trivia: there are an estimated 2.6 billion lodgepole pine and 1.6 billion Douglas-fir growing stock trees out of a total 6.5 billion trees on commercial timberland (table 5).

Table 5.--Estimated number of growing stock trees on commercial timberland in Montana by species and diameter class, 1980

Species	Diameter class (inches at breast height)													
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9
	Thousand trees													
Douglas-fir	623,997	334,025	232,430	157,814	103,102	66,148	39,650	25,281	15,278	9,153	4,961	3,040	1,811	914
Ponderosa pine	117,091	79,672	60,486	44,638	29,649	20,415	12,485	7,390	4,470	2,424	1,655	899	734	425
Western white pine	6,373	1,980	2,718	2,164	1,414	1,159	917	417	295	305	133	139	61	51
Lodgepole pine	783,092	716,553	540,392	316,640	138,231	52,875	19,650	5,944	1,790	634	146	77	13	11
Whitebark-limber pine	49,697	27,720	31,101	23,109	15,014	8,897	4,383	2,084	1,042	532	242	76	78	19
Western larch	74,644	61,852	50,848	30,079	17,071	10,285	6,967	4,774	3,375	2,488	1,829	1,413	882	531
Grand fir	69,947	39,146	19,903	11,324	5,542	3,386	1,649	966	701	291	139	123	40	27
Subalpine fir	408,942	168,212	106,299	55,709	27,881	13,570	6,290	3,360	1,330	665	386	168	50	12
Engelmann spruce	155,540	62,634	47,688	25,278	17,605	12,474	8,253	5,236	3,263	2,049	1,445	713	504	198
Western hemlock	21,291	12,159	8,010	6,845	2,746	1,811	1,047	846	467	262	212	193	103	67
Western redcedar	61,227	19,014	10,806	5,241	2,678	2,112	1,229	763	393	401	195	153	160	137
Other softwoods	189	--	25	--	--	53	--	--	--	--	--	--	--	--
Total softwoods	2,372,030	1,522,967	1,110,706	678,841	360,933	193,185	102,520	57,061	32,404	19,204	11,343	6,994	4,436	2,392
Aspen	20,528	10,411	9,602	5,915	3,544	1,420	379	70	42	33	8	7	1	8
Cottonwood	3,962	1,211	1,890	1,410	1,099	1,205	1,254	850	702	637	557	247	155	157
Other hardwoods	24,418	10,758	3,728	1,702	711	268	169	76	13	22	--	4	1	--
Total hardwoods	48,908	22,380	15,220	9,027	5,354	2,893	1,802	996	757	692	565	258	157	165
All species	2,420,938	1,545,347	1,125,926	687,868	366,287	196,078	104,322	58,057	33,161	19,896	11,908	7,252	4,593	2,557



Over 60 percent of the forest is in sawtimber size stands . . .

and only about 2 percent is nonstocked.

Over 60 percent of the commercial timberland in Montana is occupied by sawtimber stands, somewhat less than in the other Rocky Mountain States, except Idaho (table 6). And only about 2 percent of the timberland is nonstocked. But a small percentage of a large number is a large number—in this case about 218,000 acres.

The distribution of poletimber and seedling-sapling stands among owner groups varies slightly. Stand size classes alone, however, do not offer any concrete management implications. They are merely descriptive. Tree size distribution within a stand is not indicated by stand size categories. Softwood sawtimber **trees** need only be 9.0 inches diameter at breast height (d.b.h.), and sawtimber **stands** need only have half the total stocking in sawtimber and poletimber trees with sawtimber at least equal to poletimber stocking. A wide range of tree diameter classes is common in many of the forest types.

Table 6.--Area of commerical timberland in Montana by stand-size class and ownership class, 1980

Stand-size class	Ownership class				
	National Forest	Other public	Forest industry	Farmer and other private	All ownerships
	Thousand acres				
Sawtimber stands	4,995.2	485.1	966.3	1,833.1	8,279.7
Poletimber stands	2,165.2	135.0	253.7	557.0	3,110.9
Sapling and seedling stands	896.0	126.1	348.3	592.1	1,962.5
Nonstocked areas	105.4	13.1	33.0	66.7	218.2
Total	8,161.8	759.3	1,601.3	3,048.9	13,571.3

The total amount of wood, if put into a single log 50 feet in diameter, would run from Missoula to Miami.

How Much Wood?—In 1980 Montana's commercial timberland contained an estimated (and mind boggling) 26 billion cubic feet of wood in trees 5 inches d.b.h. and larger. All but 417,000 cubic feet are from softwood species (table 7). To comprehend a number of that size: if that volume were in one log 50 feet in diameter it would stretch from Missoula to Miami, about 2,500 miles. That volume represents nearly 30 percent of all the growing stock volume in the Rocky Mountain States (Green and Van Hooser 1983).

Table 7.--Net volume of timber on commercial timberland in Montana by class of timber, and softwoods and hardwoods, 1980

Class of timber	Softwoods	Hardwoods	All classes
	Million cubic feet		
Sawtimber trees:			
Sawlog portion	16,093.2	205.5	16,298.7
Upper-stem portion	1,844.2	54.8	1,899.0
Total	17,937.4	260.3	18,197.7
Poletimber trees	7,811.3	157.0	7,968.3
All growing-stock trees	25,748.7	417.3	26,166.0
Sound cull trees	303.8	7.2	311.0
Rotten cull trees	223.5	6.3	229.8
Salvable dead trees	2,870.8	20.1	2,890.9
All timber	29,146.8	450.9	29,597.7

Only about 7.8 billion cubic feet are in trees less than 9 inches d.b.h. Nearly 18 billion cubic feet are in sawtimber-size trees. The remaining 3.4 billion are in cull (540 million cubic feet) and salvable dead trees (2.9 billion cubic feet).

Lodgepole pine and Douglas-fir make up 60 percent of the volume.

Two species, lodgepole pine and Douglas-fir, make up over 60 percent of the volume (table 8), about in proportion to the areas occupied by the types. Adding ponderosa pine and western larch brings the total to 78 percent. About 60 percent of the volume is in trees less than 13 inches d.b.h.

Table 8.--Net volume of growing stock and sawtimber on commercial timberland in Montana by ownership class and species, 1980

Species	Ownership				Total
	National Forest	Other public	Forest industry	Farmer and other private	
	GROWING STOCK				
	Million cubic feet				
Douglas-fir	4,623.6	412.4	1,003.7	1,407.7	7,447.4
Ponderosa pine	785.7	192.8	287.4	901.7	2,167.6
Western white pine	186.2	9.7	22.1	4.8	222.8
Lodgepole pine	6,660.6	280.9	641.4	787.5	8,370.4
Whitebark-limber pine	611.2	25.7	43.3	87.2	767.4
Western larch	1,503.8	138.6	394.8	141.5	2,178.7
Grand fir	306.7	23.9	101.0	19.7	451.3
Subalpine fir	1,330.0	61.0	101.5	95.4	1,587.9
Engelmann spruce	1,554.2	69.1	176.1	157.7	1,957.1
Western hemlock	293.7	0.5	13.4	7.0	314.6
Western redcedar	233.2	7.7	28.4	13.6	282.9
Other softwoods	0.6	--	--	--	0.6
Total softwoods	18,089.5	1,222.3	2,813.1	3,623.8	25,748.7
Aspen	20.3	12.4	8.4	106.5	147.6
Cottonwood	--	26.3	10.5	185.0	221.8
Other hardwoods	25.7	5.8	3.1	13.3	47.9
Total hardwoods	46.0	44.5	22.0	304.8	417.3
All species	18,135.5	1,266.8	2,835.1	3,928.6	26,166.0
	SAWTIMBER				
	Million board feet, International ¼-inch rule				
Douglas-fir	17,035.4	1,615.4	3,924.1	4,911.8	27,486.7
Ponderosa pine	3,427.5	792.9	1,532.0	3,367.8	9,120.2
Western white pine	907.8	49.1	110.1	17.8	1,084.8
Lodgepole pine	15,094.1	634.3	1,098.3	1,842.2	18,668.9
Whitebark-limber pine	2,015.8	107.5	186.6	294.3	2,604.2
Western larch	6,533.5	740.4	2,024.7	533.4	9,832.0
Grand fir	1,212.3	88.7	387.2	65.9	1,754.1
Subalpine fir	4,205.0	156.9	248.7	198.1	4,808.7
Engelmann spruce	6,931.6	304.3	831.8	621.7	8,689.4
Western hemlock	1,337.1	1.1	41.2	22.1	1,401.5
Western redcedar	1,358.6	32.0	119.0	48.6	1,558.2
Other softwoods	2.3	--	--	--	2.3
Total softwoods	60,061.0	4,522.6	10,503.7	11,923.7	87,011.0
Aspen	28.5	18.6	12.5	163.4	223.0
Cottonwood	--	112.3	42.4	796.2	950.9
Other hardwoods	56.0	8.9	6.4	8.4	79.7
Total hardwoods	84.5	139.8	61.3	968.0	1,253.6
All species	60,145.5	4,662.4	10,565.0	12,891.7	88,264.6

Changes

The forest continually changes . . .

Today's forest is a product of past events, whether natural or human caused. Even without human disturbance the natural progression of things will continue. Trees will sprout from seeds or roots, trees will grow, insects, disease, fire, and wind will take their toll, and some trees will live long enough to be killed by humans. And the next cycle begins.

sometimes slowly . . .

and sometimes suddenly and drastically.

Human use of the forest results in interruptions of the natural cycle by "rescheduling" the timing of two basic events—trees dying and trees beginning. In terms of growing a perpetual crop of trees for industrial wood products, the forest manager basically has only two tools, figuratively speaking: an ax and a planting bar. It is always assumed that any area harvested or destroyed will be regenerated by some means and in a timely fashion. And the trees killed by thinning or final harvest for products are categorized as "removals." This is to differentiate that volume used from the volume in trees dying from natural causes, which may or may not be used.

Net growth is a good indicator of forest condition.

Growth.—Ordinarily the major factor of interest is growth. Annual growth per unit area is a good indicator of the nature and condition of the forest. But growth always must be looked at in relation to mortality. It is the net growth that is important.

In 1979 nearly a fifth of the growth was offset by mortality.

In 1979 timberland in Montana grew about 598 million cubic feet (1,850 million board feet of sawtimber). But in that same year destructive agents of one kind or other killed 108 million cubic feet of growing stock and 360 million board feet of sawtimber, or about 18 percent of the growth. That leaves a net growth of about 490 million cubic feet and 1.5 billion board feet of sawtimber (table 9).

Table 9.--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on commercial timberland in Montana by softwoods and hardwoods

Item	Softwoods	Hardwoods	Total
Net volume, 1980:			
Growing stock (million cubic feet)	25,748.7	417.3	26,166.0
Sawtimber[1] (million board feet)	87,011.0	1,253.6	88,264.6
Net annual growth, 1979:			
Growing stock (thousand cubic feet)	480,474	9,840	490,314
Sawtimber[1] (thousand board feet)	1,456,145	33,330	1,489,475
Annual mortality, 1979:			
Growing stock (thousand cubic feet)	105,391	2,208	107,599
Sawtimber[1] (thousand board feet)	354,228	6,236	360,464

[1]International ¼-inch rule.

Current growth is less than half the potential.

For the total commercial timberland of 13.6 million acres the net growth is about 36 cubic feet per acre. This is less than half of the 78 cubic feet per acre the land is capable of producing.

Why the difference? Briefly, the condition of the timberland. "Condition" depends upon the amount of forest area nonstocked, overstocked, understocked, or stocked with inappropriate species, the amount of old growth, and the nature and size of the trees. These factors usually are described in terms of stocking levels, stand structure, and stand size.

One way to view the forest's condition combines stand stocking and the nature of the trees making up the stand into area condition classes (table 10). (See appendix I for definitions of area condition classes.) Table 10 exhibits data for State and private owner groups. Because National Forest and other public commercial timberland may be similar, percentages derived from table 10 should describe, in a relative way, the total Montana timberland condition.

Table 10.--Area of State and private commercial timberland in Montana by forest type and area condition class, 1980

Forest type	Area condition class									Nonstocked	All classes
	10	20	30	40	50	60	70	80	90		
	Acres										
Douglas-fir	4,283	682	123,682	233,295	298,717	997,984	570,281	1,324	15,022	38,509	2,283,779
Western hemlock	--	--	3,806	—	—	4,258	--	--	--	—	8,064
Ponderosa pine	3,563	3,772	81,979	95,833	81,014	433,068	383,865	41,393	77,875	34,717	1,237,079
Western white pine	--	--	--	—	3,976	--	—	--	--	--	3,976
Lodgepole pine	6,988	52,590	11,200	157,991	310,745	135,090	69,652	--	1,639	16,340	762,235
Western larch	3,344	22,608	13,620	61,841	49,731	27,162	25,215	--	--	682	204,203
Western redcedar	--	--	--	7,160	14,325	7,007	4,407	--	--	--	32,899
Whitebark-limber pine	--	--	--	5,154	27,717	18,045	20,898	--	--	2,476	74,290
Grand fir	606	--	10,573	21,461	5,688	29,674	4,401	--	--	--	72,403
Subalpine fir-spruce	--	7,158	15,155	39,337	30,001	119,706	36,957	--	--	7,477	255,791
Engelmann spruce	--	2,909	14,961	6,243	22,910	42,130	14,377	--	820	--	104,350
Aspen	--	--	2,991	--	36,170	32,162	29,154	--	--	7,414	107,891
Cottonwood	--	--	—	1,591	11,825	33,511	90,787	--	35,732	3,975	177,421
Other hardwoods	--	4,210	--	--	--	1,424	--	--	--	840	6,474
All types	18,784	93,929	277,967	629,906	892,819	1,881,221	1,249,994	42,717	131,088	112,430	5,330,855

Old-growth stands, understocked and overstocked stands, and nonstocked areas contribute little to wood production.

Including old-growth and nonstocked areas, stands less than fully stocked with desirable trees occupy 81 percent of the commercial timberland. Of the nonstocked area, 65 percent is ponderosa pine and Douglas-fir types. These two types also make up 71 percent of the high risk old-growth stands. Not only is there too much at the extremes that contributes little to net annual growth, but future improvement in stocking in many stands is not possible because some growing space is occupied by rough and rotten trees and brush.

Nearly 108 million cubic feet of growing stock were lost to destructive agents in 1979.

Mortality.—Volume lost to insects, disease, fire, and other destructive agents in 1979 amounted to 107.6 million cubic feet of growing stock including 360.5 million board feet of sawtimber (table 11). This loss represents 19 percent of the sawtimber growth and 18 percent of the growing stock growth.

Insects, disease, and weather accounted for over half the loss.

Unknown causes of mortality resulted in 41.1 million cubic feet of lost growing stock volume (table 31 in appendix IV). Because numerous damaging agents often attack trees together or in succession, it is difficult to single out the real culprit. The top three identifiable agents—weather, insects, and disease—account for over 50 percent of the growing stock mortality. Within National Forest boundaries, mountain pine beetle and dwarf mistletoe were the primary insect and disease. In fact, they are the primary agents on all forest land.

Table 11.--Annual mortality of growing stock and sawtimber on commercial timberland in Montana by ownership class, and softwoods and hardwoods, 1979

Species group and ownership class	Growing stock	Sawtimber
	Thousand cubic feet	Thousand board feet[1]
Softwoods:		
National Forest	68,914	241,066
Other public	5,479	16,988
Forest industry	16,623	54,215
Farmer and other private	14,375	41,959
Total	105,391	354,228
Hardwoods:		
National Forest	49	--
Other public	256	725
Forest industry	35	162
Farmer and other private	1,868	5,349
Total	2,208	6,236
All species:		
National Forest	68,963	241,066
Other public	5,735	17,713
Forest industry	16,658	54,377
Farmer and other private	16,243	47,308
Total	107,599	360,464

[1]International ¼-inch rule.

On State and private land over 38 million cubic feet of growing stock and 118.6 million board feet of sawtimber were lost (table 12).

Salvaging dead trees is sometimes feasible.

Large-scale salvage operations of dead trees require large concentrations of trees, such as beetle-killed lodgepole pine stands. Otherwise, economics often dictate that salvage be coincidental to normal harvests.

But the total impact of destructive agents is not limited to mortality. Insects and diseases cause vigor loss, reducing growth, destroying seed crops, and limiting forests to less desirable trees. Often the quality and utility of the wood from these damaged trees is marginal and, therefore, impact the net volume available for products.

Controlling destructive agents is difficult and expensive.

Reducing and controlling losses caused by destructive agents require cultural practices, chemical treatments, or both. Thinning stands and planting disease-resistant species are two practices to limit losses. Chemicals to control insects and disease are expensive and regulated by law, yet have been widely used. Continued research into the problems of destructive agents will provide needed answers.

Table 12.--Annual mortality of growing stock and sawtimber on State and private commercial timberland in Montana by ownership class and cause of death, 1979

Cause of death	Ownership			Total
	State	Forest industry	Farmer and other private	
	GROWING STOCK			
	Thousand cubic feet			
Insects	1,044	2,320	2,722	6,086
Disease	635	3,211	1,801	5,647
Fire	387	426	328	1,141
Animal	61	101	204	366
Weather	951	3,008	4,097	8,056
Suppression	81	404	296	781
Unknown	2,108	5,536	6,068	13,712
Logging	150	1,652	727	2,529
Total	5,417	16,658	16,243	38,318
	SAWTIMBER			
	Thousand board feet, International ¼-inch rule			
Insects	3,478	7,407	9,526	20,411
Disease	2,357	14,263	5,850	22,470
Fire	679	615	795	2,089
Animal	278	541	659	1,478
Weather	3,445	13,931	13,073	30,449
Suppression	10	74	69	153
Unknown	6,522	14,845	16,639	38,006
Logging	224	2,701	697	3,622
Total	16,993	54,377	47,308	118,678

Nearly 300 million cubic feet were removed in 1976 . . .

Removals.—Removals can be (1) roundwood harvests of sawlogs, pulpwood, and poles, (2) residues from logging operations, and (3) precommercial thinning, other cultural operations, and shifts in land use such as land clearing for housing developments or setting aside areas for wilderness.

In 1976 removals for roundwood products totaled 246.3 million cubic feet of growing stock, including 1,460.1 million board feet of sawtimber (table 13).

mostly for roundwood products.

Roundwood products are the bulk of removals from Montana's timberland, mainly in softwoods. National Forests supplied 43 percent of the total removals, with forest industry lands supplying 34 percent.

Total removals represent 1.1 percent of the growing stock inventory and 1.8 percent of the sawtimber inventory. For every cubic foot removed 2 cubic feet grew, and for every board foot removed 1.2 board feet grew. Therefore, gains were realized in the timber inventory volume.

Table 13.--Annual removals from growing stock and sawtimber on commercial timberland in Montana by source, 1976

Source	Growing stock	Sawtimber
	Thousand cubic feet	Thousand board feet[1]
Roundwood products:		
Sawlogs	187,046	1,124,889
Veneer logs	47,589	286,201
Other roundwood products:		
Pulpwood	2,677	13,065
Cedar products	929	4,292
Utility poles	544	2,514
Houselogs	3,777	17,451
Posts and poles	3,736	11,273
Total	11,663	49,045
Total roundwood products	246,298	1,460,135
Logging residues	39,368	121,100
Other removals	4,552	27,484
Total removals	290,218	1,608,719

[1]International ¼-inch rule.

Almost half the removals were Douglas-fir and lodgepole pine.

Four species—Douglas-fir, lodgepole pine, western larch, and ponderosa pine, in that order—made up 82 percent of the removals of growing stock (table 14). Over a fourth of the material removed in 1976 from Montana's timberland was Douglas-fir. Lodgepole pine removals were nearly as great.

About 70 percent of removals were sawlogs.

Total output of sawlogs accounted for 70 percent of the timber products, by far the most important single product from Montana's forests. Slightly more than 1.1 billion board feet of lumber was produced in 1976.

Over 39 million cubic feet of growing stock were left at logging sites. These logging residues amounted to 14 percent of the growing stock removals and 7 percent of the sawtimber removals. All of the material left behind were sections of growing stock trees.

Table 14.--Annual removals from growing stock and sawtimber on commercial timberland in Montana by species, 1976

Species	Growing stock	Sawtimber
	Thousand cubic feet	Thousand board feet[1]
Douglas-fir	75,814	425,564
Engelmann spruce	21,414	120,155
Lodgepole pine	62,709	339,948
Ponderosa pine	42,172	236,710
True firs	14,224	79,853
Western larch	55,402	310,939
Western hemlock	1,584	8,833
Western redcedar	4,899	25,403
Western white pine	7,398	41,352
Other	4,602	19,962
Total	290,218	1,608,719

[1]International ¼-inch rule.

A small percent of material removed is never used.

In 1976 four counties provided over 70 percent of the harvest.

Future removals will be made up of more but smaller trees.

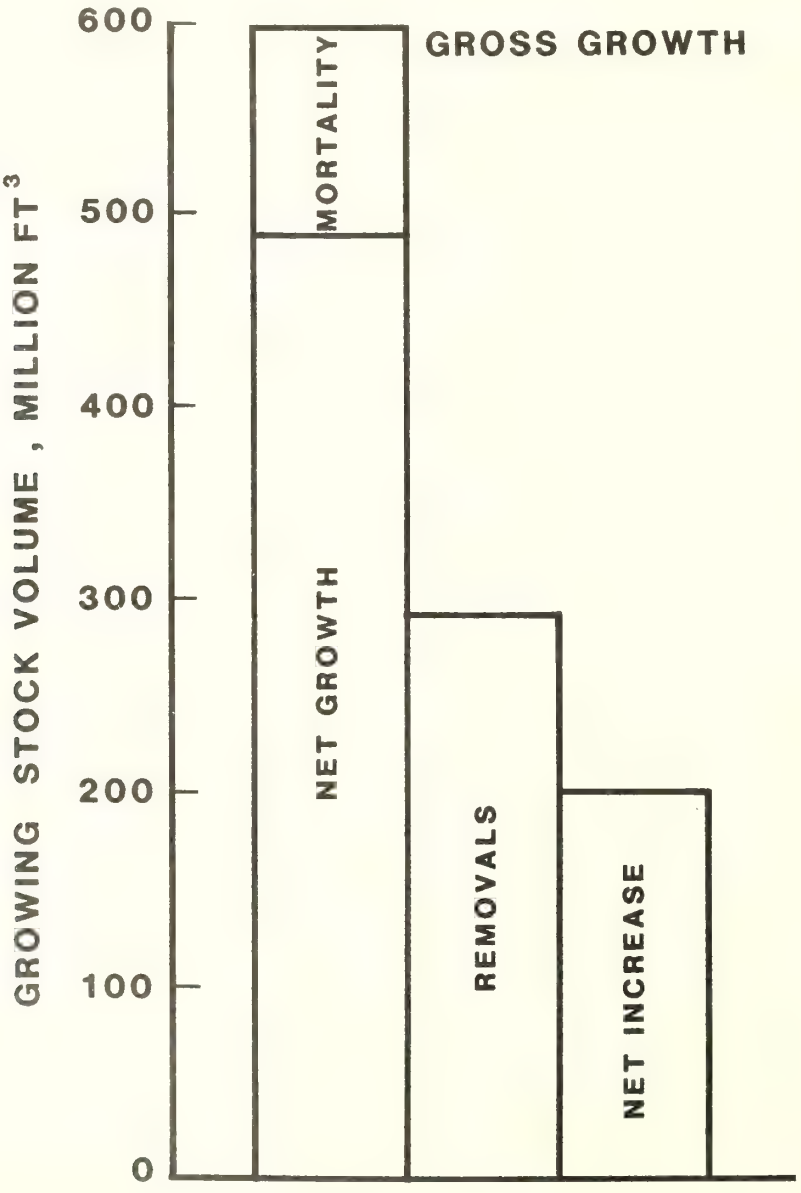
Gross growth less the mortality and the removals resulted in a net increase of 200 million cubic feet of growing stock volume.

Finally, a small percentage of total removals results in no industrial product. The standing inventory decrease from housing developments, wilderness areas, and thinnings represents less than 2 percent of the volume removed.

Of the growing stock removals, 70.4 percent came from the four major timber-producing counties, Lincoln, Flathead, Sanders, and Missoula. All have substantial areas in National Forests and industry ownership.

Maintaining the 1976 level of cubic foot output from these counties, and most of Montana, will require harvesting more and more acres each year in the future. Why? Because the growth rate generally will not produce as large a tree in the next hundred years as is presently being removed. Therefore, in the future smaller trees must be removed from more acres to total the same output.

What Does It Mean?—To summarize: In 1979 about 598 million cubic feet of wood was added to the estimated 26.2 billion cubic feet of growing stock volume on Montana's commercial timberland through tree growth. Put another way, the growing stock volume increased by about 2.3 percent. Unfortunately, about 107.6 million cubic feet of that growth (18 percent) was offset by mortality, leaving a net increase of only 490 million cubic feet.



Removals of 290.2 million cubic feet amounted to only about 1.1 percent of the total inventory volume but nearly 60 percent of the net growth. The net effect of all this was a net increase in the growing stock volume of some 200 million cubic feet over the entire State.

Despite the encouraging future of the timber resource, a situation developing in western Montana should be of concern.

But removal levels on private land in some western counties exceed volume and growth.

As previously stated, over 70 percent of the roundwood removals came from four counties in northwestern Montana (Lincoln, Flathead, Sanders, and Missoula). In these counties, the removals from lands owned by forest industry far exceeded growth. In Sanders and Missoula Counties removals from nonindustrial private owners also exceeded growth. While this need not necessarily be considered alarming in any one year, continuation of those harvest levels in relation to inventory volume could spell trouble for the future.

For example, in Lincoln County removals from industry lands amounted to about 4.3 percent of the growing stock and 6.1 percent of the sawtimber volume. In Sanders County removals were 5.3 percent of growing stock and 8.1 percent of the sawtimber volume.

Growing stock and sawtimber volumes on these lands could be gone in a few decades.

The implications are fairly clear: continuation of these levels of removals will eliminate the standing inventory volume on private lands in these counties in just a few decades.

Reducing removals to a "cut-equals-growth" level would necessarily mean a substantial reduction in deliveries to the mills from private lands. And assuming the total removal of 290 million cubic feet was necessary to meet the wood products demands from Montana's forests, alternate sources would be needed to make up the difference. That of course means public lands. How much more public timber will be available in the future is not known. Present demands on public forests and commitments for future generations make it questionable whether these lands can or will make up the entire difference.

A comprehensive assessment of future timber supplies is needed.

A comprehensive study is needed for taking a realistic look at alternative future harvest levels from all ownerships and the consequences to be expected from each in terms of economic impacts at the State and local levels, and at biological and environmental impacts on the forests and related resources.

ABOUT FOREST INDUSTRIES

Since the mid-1970's the number of active wood processing plants operating in Montana has changed almost weekly as flip flops in the economy affected the demand for lumber and plywood. In 1981 Montana's forest industries included 142 active sawmills, five plywood plants, a pulp and paper mill, two board plants (fiberboard and particleboard), and about 73 other plants producing miscellaneous products such as posts, poles, house logs, and cedar specialities (Keegan 1983) (table 15).

Forest industries contribute substantially to Montana's economy.

Table 15.--Active wood products plants in Montana, by county and type, 1976

County of location	Type of wood product plant						
	Lumber	Plywood	Particleboard and fiberboard	Pulp and paper	Posts and poles	House logs	Other products
Beaverhead	3	--	--	--	2	2	1
Broadwater	2	--	--	--	--	--	--
Cascade	1	--	--	--	--	--	--
Custer	1	--	--	--	--	--	--
Fergus	7	--	--	--	--	--	1
Flathead	18	2	1	--	8	2	1
Gallatin	5	--	--	--	4	1	1
Granite	1	--	--	--	2	--	--
Jefferson	--	--	--	--	3	--	--
Judith Basin	1	--	--	--	--	--	--
Lake	1	--	--	--	--	--	--
Lewis and Clark	2	--	--	--	3	1	--
Lincoln	16	1	--	--	--	--	6
Madison	4	--	--	--	2	--	--
Meagher	2	--	--	--	--	--	1
Mineral	3	--	--	--	1	1	2
Missoula	7	2	1	1	3	2	1
Musselshell	3	--	--	--	--	--	--
Park	5	--	--	--	3	--	--
Powell	1	--	--	--	1	--	--
Ravalli	5	--	--	--	4	7	2
Rosebud	1	--	--	--	--	--	--
Sanders	8	--	--	--	1	3	1
Silver Bow	1	--	--	--	--	--	--
Total	98	5	2	1	37	19	17

Source: University of Montana, Bureau of Business and Economic Research, Montana Forest Industries Data Collection System (Missoula, MT, 1979).

Sawmills

Lumber production has evolved from muscle power to water power to steam power to electric power.

Since early settlement, lumber production has been Montana's most important and most diverse forest industry. From the crude beginning with the pit saw at St. Mary's Mission, the industry followed the same progression as it had in the East. Water-powered, then steam-powered, then electric-power mills increased the capacity to produce lumber with both circular and gang saws.

Today, sawmills in Montana range in size from small family operations producing only a few thousand board feet of lumber per year, frequently on a demand basis, to fully automated mills with plant capacities exceeding 100 million board feet.

The trend is toward fewer but larger mills, mostly in western Montana.

Since World War II the trend has been toward fewer but larger mills, but even as late as 1956 there were 330 sawmills in Montana, most of them small. By 1966 small sawmills were producing only about 10 percent of the total lumber output. In 1981 the 28 largest sawmills in Montana produced about 93 percent of the lumber.

Nearly three-fourths of the sawmills active in 1981 were in western Montana. Fifty-four were in Flathead, Lincoln, Lake, and Sanders Counties. These mills and the 22 in Missoula, Ravalli, and Mineral Counties accounted for some 80 percent (843 million board feet) of the 1,071 million board feet of lumber produced that year.

Plywood Plants

The four plywood plants increased production between 1973 and 1976.

Although Montana had only four plywood plants active in 1981, two in Flathead and one each in Missoula and Lincoln Counties, some "bragging rights" did exist. The Champion Bonner plant, completed in 1974, reportedly has the largest softwood lathe capacity of any plant in the world. The addition of this plant capacity helped send the production of plywood from around 420 million square feet in 1973 to 647 million square feet in 1976. Production in 1981, however, was down to 569 million square feet, as the plant in Missoula County was temporarily shut down.

Pulp, Paper, and Board Plants

The three pulp, paper, and board plants are not direct consumers of timber resources.

In 1981 the pulp, paper, and board industries were represented in Montana by three plants: a Kraft pulp and paper mill and a particleboard plant in Missoula County, and a fiberboard plant in Flathead County. They have no significant direct impact on roundwood supplies from the forests. Their major source of raw material is the manufacturing residues from plywood plants and sawmills.

Their impact on the economy is twofold. In addition to the contribution to the economy generated by their operation, their use of waste products from other forest industries generates significant revenues for their suppliers. The sales value of products shipped from these plants in 1981 was about $214 million.

Other Wood Products

A number of small plants produce a variety of products such as posts, house logs, mine timbers, and so on. In 1976 output from these plants was valued in excess of $33 million—not a big portion of the State's total economic activity but significant to local communities.

The demand for house logs is increasing.

House Logs.—Houses built with logs are increasingly popular in Montana and neighboring States, particularly for second homes. Aside from their rustic appearance, they are well suited for the do-it-yourselfer who wants to be creative and save on construction costs.

In 1981 about 4 million linear feet of house logs valued at over $7.7 million were turned out by 25 plants in the business.

Output of posts, poles, . . .

Posts and Poles.—Plants producing these items numbered 37 in 1981. In addition to the roundwood products, some plants produced other products such as grape stakes. The total value of output from these plants was nearly $5.5 million for the 4 million pieces produced.

and other products was worth nearly $26 million in 1981.

Miscellaneous.—This catch-all group of plants turned out mine timbers, structural timbers, railroad ties, cedar specialty products such as shakes and shingles, and utility poles. In 1981 output of these products was valued at $20.4 million.

Residues and Utilization

Over half the volume in logs delivered to sawmills never makes it to the lumber yard. In fact, a substantial portion of the volume of any roundwood-derived wood product ends up on the floor awaiting disposal.

Residues are classed as coarse, fine, and bark.

Residues come in several flavors: coarse (slabs, edgings, trimmings, and peeler cores), fine (planer shavings and sawdust), and bark. Coarse residues are chippable, although most of the peeler cores are cut into lumber, rendering only slabs and edgings to be disposed of.

Most mill residues are no longer burned except for fuel.

Disposal of milling offal used to be rather routine: it was burned. The amount of smoke issuing from the teepee burners announced to observers how business was doing at the sawmill. This practice had two major features: it wasted resources and polluted the air.

In 1981 nearly all residues were used.

Enter the pulp, paper, and board industry. It does not create residues but uses them as raw material. Some residues are still burned but as fuel in wood-fired boilers.

In 1981 nearly all residues were used:

Residue type	Estimated volume generated[2]	Percent used
	Thousand bone-dry units	
Coarse	817	99
Fine	427	93
Bark	321	89
	Total	95

By contrast, in 1969 less than two-thirds of generated residues were used.

Markets

The primary markets for Montana's wood products are the Midwest and Great Plains States.

The primary market area for wood products manufactured in Montana is the north-central region of the United States (the Midwest and Great Plains States). Over a third of the plywood and lumber ended up there in 1981. Much of the rest went to the Rocky Mountain and Pacific Coast States.

The primary market for posts and poles was Montana, with significant amounts going to the Pacific Coast. House logs, on the other hand, stayed largely in the Rocky Mountain and Pacific Coast area, although over a third of the production went to the north-central region. In fact, shipments of all wood products to that region in 1981 were about 35 percent of Montana's total production.

REFERENCES

Arno, Stephen F. Forest regions of Montana. Research Paper INT-218. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1979. 39 p.

Bailey, Robert W., compiler. Description of the ecoregions of the United States. Miscellaneous Publication 1391. Washington, DC: U.S. Department of Agriculture, Forest Service; 1980. 77 p. plus map.

Ford-Robertson, F. C., ed. Terminology of forest science, technology practice and products: English-language version. The Multilingual Forestry Terminology Series No. 1. Washington, DC: Society of American Foresters; 1971. 349 p.

Green, Alan W.; Van Hooser, Dwane D. Forest resources of the Rocky Mountain States. Resource Bulletin INT-33. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1983. 127 p.

Hutchison, S. Blair; Kemp, Paul D. Forest resources of Montana. Forest Resource Report 5. Washington, DC: U.S. Department of Agriculture, Forest Service; 1952. 76 p.

Keegan, Charles E., III; Jackson, Timothy P.; Johnson, Maxine C. Montana's forest products industry. Missoula, MT: University of Montana, Bureau of Business and Economic Research; 1983. 85 p.

[2]A bone-dry unit is 2,400 points, ovendry weight.

Kuchler, A. W. Potential natural vegetation of the conterminous United States [map and manual]. Special Publication 36. New York: American Geographical Society; 1964. 116 p.

Oblinger-McCaleb Architects, Engineers, and Planners. Old West region non-resident travel and recreation survey. Denver, CO; November 1980; Summary Report. 53 p.

Pfister, Robert D. Land capability assessment by habitat types. In: America's renewable resource potential - 1975: the turning point; Proceedings, 1975 national convention, Society of American Foresters. Washington, DC: Society of American Foresters; 1976: 312-325.

Pissot, Henry J.; Hanson, Harold E. Forest resources of western Montana. Resource Bulletin INT-1. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1963. 46 p.

Schweitzer, Dennis L.; Benson, Robert E.; McConnen, Richard J. A descriptive analysis of Montana's forest resources. Resource Bulletin INT-11. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1975. 100 p.

U.S. Department of Agriculture, Forest Service. An assessment of the forest and range land situation in the United States. Forest Resource Report 22. Washington, DC: U.S. Department of Agriculture, Forest Service; 1981. 352 p.

APPENDIX I: TERMINOLOGY

Acceptable trees—Growing stock trees meeting specified standards of size and quality, but not qualifying as desirable trees.

Area condition class—See stocking.

Bureau of Land Management land—Federal lands administered by the Bureau of Land Management, U.S. Department of the Interior.

Commercial forest land—See commercial timberland.

Commercial species—Tree species suitable for industrial wood products.

Commercial timberland—Forest land that is producing or is capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation. (Note: Areas qualifying as commercial timberland have the capability of producing in excess of 20 cubic feet per acre per year of industrial wood in natural stands. Currently, inaccessible and inoperable areas are included.)

Cord—A pile of stacked wood containing 128 cubic feet within its outside surfaces. The standard dimensions are 4 by 4 by 8 feet.

Cropland—Land under cultivation within the past 24 months, including cropland harvested, crop failures, cultivated summer fallow, idle cropland used only for pasture, orchards, and land in soil improving crops, but excluding land cultivated in developing improved pasture.

Cull trees—Live trees of sawtimber and poletimber size that are unmerchantable for saw logs now or prospectively because of roughness, rot, or species (also see rotten trees and rough trees).

Deferred forest land—National Forest lands that meet productivity standards for commercial forest, but are under study for possible inclusion in the Wilderness System.

Desirable trees—Growing stock trees (1) having no serious defect in quality to limit present or prospective use for timber products; (2) of relatively high vigor; and (3) containing no pathogens that may result in death or serious deterioration before rotation age.

Diameter classes—A classification of trees based on diameter outside bark measured at breast height (4½ feet above the ground). D.b.h. is the common abbreviation for "diameter at breast height." When using 2-inch diameter classes, the 6-inch class, for example, includes trees 5.0 through 6.9 inches d.b.h. inclusive.

Ecosystem—A complete, interacting system of organisms considered together with their environment; for example, a marsh, a watershed, a lake, etc.

Establishment—An economic unit, generally at a single physical location, where business is conducted or where services or industrial operations are performed.

Farmer and other private—All private ownerships except industry.

Farmer-owned lands—Lands owned by a person who operates a farm, either doing the work himself or directly supervising the work.

Forest industry lands—Lands owned by companies or individuals operating wood-processing plants.

Forest land—Land at least 10 percent stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. (Also see Commercial timberland, Productive-reserved forest land, and Other forest land.) Forest land includes transition zones, such as areas between heavily forested and nonforested lands that are at least 10 percent stocked with forest trees, and forest areas adjacent to urban and built-up

lands. Also included are pinyon-juniper and chaparral areas in the West, and afforested areas. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet in width.

Forest site productivity class—A classification of forest land in terms of potential cubic-foot volume growth per acre at culmination of mean annual increment in fully stocked natural stands.

Forest types—A classification of forest land based upon the tree species presently forming a plurality of stocking. For poletimber size trees and larger, stocking is determined from basal area occurrence and for trees less than 5.0 inches d.b.h. from number of trees.

Major western forest type groups:

Douglas-fir—Forests in which Douglas-fir comprises a plurality of the stocking. (Common associates include western hemlock, western redcedar, the true firs, redwood, ponderosa pine, and larch.)

Ponderosa pine—Forests in which ponderosa pine comprises a plurality of the stocking. (Common associates include Jeffrey pine, sugar pine, limber pine, Arizona pine, Apache pine, Chihuahua pine, Douglas-fir, incense cedar, and white fir.)

Lodgepole pine—Forests in which lodgepole pine comprises a plurality of the stocking. (Common associates are alpine fir, western white pine, Engelmann spruce, aspen, and larch.)

Fir-spruce—Forests in which true firs (*Abies* spp.), Engelmann spruce, or Colorado blue spruce, singly or combination, comprises a plurality of the stocking. (Common associates are mountain hemlock and lodgepole pine.)

Aspen—Forests in which aspen comprises a plurality of the stocking.

Hardwoods—Forests in which red alder or other western hardwoods, singly or in combination, comprise a plurality of the stocking.

Pinyon-juniper—Forests in which pinyon pine and/or juniper comprise a plurality of the stocking.

Growing stock trees—Live sawtimber trees, poletimber trees, saplings, and seedlings meeting specified standards of quality or vigor; excludes cull trees.

Growing stock volume—Net volume in cubic feet of live sawtimber and poletimber trees from stump to a minimum 4-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.

Growth—See definition for "Net annual growth."

Hardwoods—Dicotyledonous trees, usually broad-leaved and deciduous.

Indian lands—Tribal lands held in fee by the Federal Government but administered for Indian tribal groups and Indian trust allotments.

Industrial wood—All commercial roundwood products except fuelwood.

Land area—Census definition: The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than 1/8 of a statute mile in width; and lakes, reservoirs, and ponds less than 40 acres of area.

Forest Survey definition: Same as above except minimum width of streams, etc., is 120 feet and minimum size of lakes, etc., is 1 acre.

Logging residues—The unused portions of poletimber and sawtimber trees cut or killed by logging.

Mortality—The volume of sound wood in live trees that have died from natural causes during a specified period.

National Forest System land—Federal lands designated by Executive Order or statute as National Forests or purchase units, and other lands under the administration of the Forest Service including experimental areas and Bankhead-Jones Title III lands.

Net annual growth—The net increase in the volume of trees during a specified year. Components of net annual growth include the increment in net volume of trees at the beginning of the specific year surviving to its end, plus the net volume of trees reaching the minimum size class during the year, minus the volume of trees that died during the year, and minus the net volume of trees that became rough or rotten trees during the year.

Net volume in board feet—The gross board-foot volume of trees less deductions for rot or other defect affecting use for lumber.

Net volume in cubic feet—Gross volume in cubic feet less deductions for rot, roughness, and poor form. Volume is computed for the central stem from a 1-foot stump to a minimum 4.0-inch top diameter outside bark, or to the point where the central stem breaks into limbs.

Nonforest land—Land that has never supported forests and lands formerly forested where use for timber management is precluded by development for other uses. (Note: Includes crop lands, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline clearings of any width, and 1- to 40-acre areas of water classified by the Bureau of the Census as nonforest land. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide, and clearings, etc., more than 1 acre in size, to qualify as nonforest land.)

Nonstocked areas—Commercial timberland less than 10 percent stocked with growing stock trees.

Other Federal land—Federal land other than lands administered by the Forest Service or the Bureau of Land Management.

Other forest land—Forest land incapable of producing 20 cubic feet per acre of industrial wood under natural conditions because of adverse site conditions such as sterile soils, dry climate, poor drainage, high elevation, steepness, or rockiness.

Other land—All land area other than forest and range lands.

Other private land—Privately owned land other than forest industry or farmer-owned.

Other public land—Publicly owned land other than National Forest System land.

Other removals—The net volume of growing stock trees removed from the inventory by cultural operations such as timber-stand improvement, by land clearing, and by changes in land use, such as a shift to wilderness.

Other species—Tree species of typical small size, poor form, or inferior quality that normally do not develop into trees suitable for industrial wood products.

Ownership—The property under one owner, including all parcels of land in the United States.

Pasture—Land that is currently improved for grazing by cultivation, seeding, or irrigation.

Plant byproducts—Wood material from primary manufacturing plants (such as slabs, edgings, trimmings, miscuts, sawdust shavings, veneer cores and clippings, and pulp screenings) that are used for some products.

Poletimber stands—Stands at least 10 percent stocked with growing stock trees, of which half or more of the stocking is sawtimber and/or poletimber trees with poletimber stocking exceeding that of sawtimber. (See definition for Stocking.)

Poletimber trees—Live trees of commercial species at least 5.0 inches in diameter at breast height but smaller than sawtimber size, and of good form and vigor.

Potential growth—The average net annual growth per acre attainable in fully stocked natural stands at culmination of mean annual growth of dominant or codominant trees.

Primary manufacturing plants—Plants using roundwood products such as saw logs, pulpwood bolts, veneer logs, etc.

Productive-reserved forest land—Productive public forest land withdrawn from timber utilization through statute or administrative regulations.

Productivity class—A classification of forest land in terms of potential growth in cubic feet of fully stocked natural stands.

Rangeland—Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs, including land revegetated naturally or artificially that is managed like native vegetation. Rangeland includes natural grasslands, savannas, shrublands, most deserts, tundra, alpine communities, coastal marshes, and wet meadows that are less than 10 percent stocked with forest trees of any size.

Removals—The net volume of growing-stock or sawtimber trees removed from the inventory by harvesting; cultural operations, such as timber stand improvement; land clearings; or changes in land use.

Residues:

- Coarse residues—Plant residues suitable for chipping, such as slabs, edgings, and ends.
- Fine residues—Plant residues not suitable for chipping, such as sawdust, shavings, and veneer clippings.
- Logging residues—The unused portions of sawtimber and poletimber trees cut or killed by logging.
- Plant residues—Wood materials from primary manufacturing plants that are not used for any product.
- Urban residues—Wood materials from urban areas, such as newspapers, lumber and plywood from building demolition, and used packaging and shipping wood materials.

Rotten trees—Live trees of commercial species that do not contain a saw log now or prospectively, primarily because of rot (such as when rot accounts for more than 50 percent of the total cull volume).

Rough trees—(a) Live trees of commercial species that do not contain a saw log, now or prospectively, primarily because of roughness, poor form, splits, and cracks, and with less than one-third of the gross tree volume in sound material; and (b) all live trees of noncommercial species.

Roundwood equivalent—The volume of logs or other round products required to produce the lumber, plywood, woodpulp, paper, or other similar products.

Roundwood logs—Logs, bolts, or other round sections cut from trees.

Salvable dead trees—Standing or down dead trees that are considered currently or potentially merchantable by regional standards.

Saplings—Live trees of commercial species 1.0 inch to 5.0 inches d.b.h. and of good form and vigor.

Sapling and seedling stands—Stands at least 10 percent occupied with growing stock trees of which more than half of the stocking is saplings and/or seedlings.

Saw log—A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight, and with a minimum diameter inside bark for softwoods of 6 inches (8 inches for hardwoods) or other combinations of size and defect specified by regional standards.

Saw log portion—That part of the bole of sawtimber trees between the stump and the saw log top.

Saw log top—The point on the bole of sawtimber trees above which a saw log cannot be produced. The minimum saw log top is 7.0 inches diameter outside bark (d.o.b.) for softwoods, and 9.0 inches d.o.b. for hardwoods.

Sawtimber stands—Stands at least 10 percent occupied with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber trees—Live trees of commercial species containing at least one 12-foot saw log or two noncontiguous 8-foot logs, and meeting regional specifications for freedom from defect. Softwood trees must be at least 9 inches d.b.h. and hardwood trees 11 inches d.b.h.

Sawtimber volume—Net volume of the saw log portion of live sawtimber trees in board feet.

Seedlings—Established live trees of commercial species less than 1.0 inch d.b.h. and of good form and vigor.

Softwoods—Monocotyledonous trees, usually evergreen, having needle or scalelike leaves.

Special interest areas—Areas described in the Environmental Policy Act of 1970 that include (1) cultural areas—historic or prehistoric sites and places of obvious future historical value, and (2) natural areas—outstanding examples of the Nation's geological and ecological features.

Standard error—An expression of the degree of confidence that can be placed on an estimated total or average obtained by statistical sampling methods. Sampling errors do not include technique errors that could occur in photo classification of areas, measurement of volume, or compilation of data.

Stand improvement—Measures such as thinning, pruning, release cutting, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.

Stand-size classes—A classification of forest land based on the predominant size of timber present. See Poletimber stands, Sapling and seedling stands, and Sawtimber stands.

State, county, and municipal lands—Lands owned by States, counties, and local public agencies, or lands leased by these governmental units for more than 50 years.

Stocking—Stocking is an expression of the extent to which growing space is effectively utilized by present or potential growing stock trees of commercial species. "Percent of stocking" is synonymous with "percentage of growing space occupied" and means the ratio of actual stocking to full stocking for comparable sites and stands. Basal area is used as a basis for measuring stocking. Full utilization of the site is assumed to occur over a range of basal area. As an interim guide, 60 percent of the normal yield table values has been used to establish the lower limit of this range, which represents full-site occupancy. This is called 100 percent stocking. The upper limit of full stocking has been set at 132 percent. Sites with less than 100 percent stocking represent less than full-site occupancy. Overstocking is characterized by sites with 133 percent or more stocking.

"Stocking percentages" express current area occupancy in relation to specified standards for full stocking based on number, size, and spacing of trees considered necessary to fully utilize the forest land, and are summarized into the following area condition classes:

Class 10—Areas fully stocked (100 to 132 percent) with desirable trees and not overstocked (133 percent or more).

Class 20—Areas fully stocked with desirable trees, but overstocked with all live trees.

Class 30—Areas medium to fully stocked (60 to 99 percent) with desirable trees and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Class 40—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and/or conditions that ordinarily prevent occupancy by desirable trees.

Class 50—Areas poorly stocked (16.7 to 59 percent) with desirable trees, but fully stocked with growing stock trees.

Class 60—Areas poorly stocked with desirable trees, but with medium to full stocking of growing stock trees.

Class 70—Areas nonstocked (less than 16.7 percent) or poorly stocked with desirable trees, and poorly stocked with growing stock trees.

Class 80—Low-risk old-growth stands.

Class 90—High-risk old-growth stands.

Nonstocked—Areas less than 16.7 percent stocked with growing stock trees.

Upper-stem portion—That part of the main stem or fork of sawtimber trees above the saw log top to a minimum top diameter of 4.0 inches outside bark or to the point where the main stem or fork breaks into limbs.

Urban and other areas—Areas within the legal boundaries of cities and towns; suburban areas developed for residential, industrial, or recreational purposes; school yards; cemeteries; roads; railroads; airports; beaches; powerlines and other rights-of-way; or other nonforest land not included in any other specified land use class.

Water—Census definition: Streams, sloughs, estuaries, and canals more than 1/8 of a statute mile in width; and lakes, reservoirs, and ponds more than 40 acres in area.

Forest Survey definition: Same as above except minimum width of streams, etc., is 120 feet, and minimum size of lakes, etc., is 1 acre.

Wilderness—An area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value (from Wilderness Act 1964).

APPENDIX II: INVENTORY TECHNIQUES

The inventory was designed to provide reliable statistics primarily at the State and working circle levels. Procedures were as follows:

1. Initial area estimates were based on the classification of 620,227 sample points systematically placed on the latest aerial photographs available. The sample points were summarized and grouped into strata for subsequent field sampling. The photo points, adjusted to meet known land areas, were used to compute area expansion factors for the field stratum means.
2. Land classification and estimates of timber characteristics and volume were based on observations and measurements recorded at 3,857 ground sample locations. Sample trees were selected using a 10-point cluster, which includes fixed plots (1/300-acre) for trees less than 5 inches d.b.h. and variable plots (40-BAF) for trees 5 inches d.b.h. or larger.
3. Kemp's equations were used to compute volume and defect.
4. All photo and field data were sent to Ogden, UT, for editing and were punched onto cards and stored for machine computing, sorting, and tabulation. Final estimates were based on statistical summaries of the data.

Table 16.--Area of other public and private forest land excluding National Forest in Montana with percent standard error, 1980

Item	Softwoods		Hardwoods		All types	
	Acres	Percent standard error	Acres	Percent standard error	Acres	Percent standard error
Commercial timberland	5,110,355	±1.1	299,174	±8.7	5,409,529	±1.0
Productive reserved[1]	110,021		11,866		121,887	
Other forest land:						
Unproductive reserved[1]	28,562		4,209		32,771	
Unproductive nonreserved	737,431	±6.2	107,229	±15.8	844,660	±5.7

[1]Reserved land areas are estimated from aerial photos without field verification; therefore, standard errors are not calculated.

Table 17.--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on other public and private commercial timberland excluding National Forest in Montana with percent standard error

Item	Softwoods		Hardwoods		All types	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume, 1980:						
Growing stock (M cubic feet)	7,659,213	±1.9	371,332	±11.2	8,030,545	±1.8
Sawtimber (M board feet)	26,949,954	±2.3	1,169,147	±13.8	28,119,101	±2.3
Net annual growth, 1979:						
Growing stock (M cubic feet)	160,528	±3.5	7,952	±15.1	168,480	±3.4
Sawtimber (M board feet)	605,740	±3.6	30,755	±21.6	636,495	±3.6
Annual mortality, 1979:						
Growing stock (M cubic feet)	36,477	±6.6	2,159	±28.0	38,636	±6.5
Sawtimber (M board feet)	113,162	±8.9	6,236	±42.7	119,398	±8.8

APPENDIX III: RELIABILITY OF THE DATA

Individual cells within tables should be used with caution. Some are based on very small sample sizes, and so result in high sampling errors. The standard error percentages shown in tables 16 and 17 were calculated at the 67 percent confidence level.

APPENDIX IV: FOREST SURVEY TABLES

Table 18.--Area of commercial timberland in Montana by forest type, stand-size class, and productivity class, 1980

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
	- - - - - - - - - - Thousand acres - - - - - - - - - -					
Douglas-fir:						
Sawtimber	0.6	437.6	1,134.8	1,381.5	590.1	3,544.6
Poletimber	--	33.4	127.8	319.5	173.8	654.5
Sapling and seedling	--	20.5	132.8	233.9	193.3	580.5
Nonstocked	--	1.4	38.9	26.3	27.3	93.9
Total	0.6	492.9	1,434.3	1,961.2	984.5	4,873.5
Western hemlock:						
Sawtimber	0.6	41.9	27.1	13.7	0.5	83.8
Poletimber	--	2.7	--	0.1	--	2.8
Sapling and seedling	--	4.3	2.6	--	--	6.9
Nonstocked	--	1.0	--	--	2.1	3.1
Total	0.6	49.9	29.7	13.8	2.6	96.6
Ponderosa pine:						
Sawtimber	1.4	49.1	161.0	271.3	617.9	1,100.7
Poletimber	--	9.8	5.0	45.6	111.9	172.3
Sapling and seedling	--	3.4	16.9	46.9	257.2	324.4
Nonstocked	--	--	6.1	9.8	23.8	39.7
Total	1.4	62.3	189.0	373.6	1,010.8	1,637.1
Western white pine:						
Sawtimber	1.9	6.7	23.8	0.4	--	32.8
Poletimber	--	4.6	0.2	--	0.1	4.9
Sapling and seedling	--	--	0.6	--	--	0.6
Nonstocked	--	--	--	--	--	--
Total	1.9	11.3	24.6	0.4	0.1	38.3
Lodgepole pine:						
Sawtimber	3.9	104.0	546.6	656.1	235.7	1,546.3
Poletimber	5.0	94.5	618.3	735.5	362.6	1,815.9
Sapling and seedling	--	41.4	81.6	182.2	159.5	464.7
Nonstocked	--	0.3	7.8	15.1	15.4	38.6
Total	8.9	240.2	1,254.3	1,588.9	773.2	3,865.5
Western larch:						
Sawtimber	26.9	179.9	117.8	75.3	4.8	404.7
Poletimber	2.4	33.3	59.6	10.7	--	106.0
Sapling and seedling	1.1	28.5	75.4	33.0	14.4	152.4
Nonstocked	--	6.2	3.2	0.6	--	10.0
Total	30.4	247.9	256.0	119.6	19.2	673.1
Western redcedar:						
Sawtimber	0.6	36.4	55.3	8.5	--	100.8
Poletimber	--	--	12.1	--	--	12.1
Sapling and seedling	--	2.4	7.1	--	--	9.5
Nonstocked	--	--	--	--	--	--
Total	0.6	38.8	74.5	8.5	--	122.4
Whitebark-limber pine:						
Sawtimber	--	--	7.7	35.3	83.5	126.5
Poletimber	--	--	--	--	33.4	33.4
Sapling and seedling	--	--	3.5	--	15.7	19.2
Nonstocked	--	--	--	--	2.5	2.5
Total	--	--	11.2	35.3	135.1	181.6

(con.)

Table 18. (Con.)

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
	- - - - - - - - - - Thousand acres - - - - - - - - - -					
Grand fir:						
Sawtimber	4.3	32.2	83.4	15.8	--	135.7
Poletimber	--	23.9	10.2	--	--	34.1
Sapling and seedling	--	4.8	30.5	4.5	--	39.8
Nonstocked	--	--	1.7	--	--	1.7
Total	4.3	60.9	125.8	20.3	--	211.3
Subalpine fir-spruce:						
Sawtimber	4.5	105.6	307.9	257.4	123.9	799.3
Poletimber	--	9.1	65.4	52.6	51.0	178.1
Sapling and seedling	--	11.4	104.6	94.4	50.3	260.7
Nonstocked	--	--	9.0	5.5	--	14.5
Total	4.5	126.1	486.9	409.9	225.2	1,252.6
Engelmann spruce:						
Sawtimber	--	50.1	102.1	51.0	18.1	221.3
Poletimber	--	7.9	6.1	17.4	0.8	32.2
Sapling and seedling	--	29.9	13.9	10.8	3.7	58.3
Nonstocked	--	--	2.1	--	--	2.1
Total	--	87.9	124.2	79.2	22.6	313.9
Other softwoods:						
Sawtimber	--	--	--	--	0.1	0.1
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	--	0.1	0.1
Aspen:						
Sawtimber	--	4.2	7.2	9.0	--	20.4
Poletimber	--	3.7	6.0	21.2	19.3	50.2
Sapling and seedling	--	--	1.3	7.7	23.0	32.0
Nonstocked	--	--	--	3.6	3.7	7.3
Total	--	7.9	14.5	41.5	46.0	109.9
Cottonwood:						
Sawtimber	--	--	7.2	38.0	111.0	156.2
Poletimber	--	--	--	3.5	9.8	13.3
Sapling and seedling	--	--	--	--	9.4	9.4
Nonstocked	--	--	--	--	4.0	4.0
Total	--	--	7.2	41.5	134.2	182.9
Other hardwoods:						
Sawtimber	--	--	--	3.1	3.4	6.5
Poletimber	--	--	--	1.1	--	1.1
Sapling and seedling	--	--	--	4.1	--	4.1
Nonstocked	--	--	--	--	0.8	0.8
Total	--	--	--	8.3	4.2	12.5
All types:						
Sawtimber	44.7	1,047.7	2,581.9	2,816.4	1,789.0	8,279.7
Poletimber	7.4	222.9	910.7	1,207.2	762.7	3,110.9
Sapling and seedling	1.1	146.6	470.8	617.5	726.5	1,962.5
Nonstocked	--	8.9	68.8	60.9	79.6	218.2
Total	53.2	1,426.1	4,032.2	4,702.0	3,357.8	13,571.3

Table 19.--Area of National Forest owned commercial timberland in Montana by forest type, stand-size class, and productivity class, 1980

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
			Thousand acres			
Douglas-fir:						
Sawtimber	0.6	378.7	917.1	531.0	206.0	2,033.4
Poletimber	--	29.9	109.6	139.5	29.2	308.2
Sapling and seedling	--	18.2	90.7	42.3	35.1	186.3
Nonstocked	--	1.4	38.9	12.5	2.4	55.2
Total	0.6	428.2	1,156.3	725.3	272.7	2,583.1
Western hemlock:						
Sawtimber	0.6	41.9	23.3	13.7	0.5	80.0
Poletimber	--	2.7	--	0.1	--	2.8
Sapling and seedling	--	--	2.6	--	--	2.6
Nonstocked	--	1.0	--	--	2.1	3.1
Total	0.6	45.6	25.9	13.8	2.6	88.5
Ponderosa pine:						
Sawtimber	--	31.0	74.7	56.8	106.8	269.3
Poletimber	--	5.4	1.0	27.7	8.9	43.0
Sapling and seedling	--	2.7	9.8	5.0	5.4	22.9
Nonstocked	--	--	0.7	1.8	2.3	4.8
Total	--	39.1	86.2	91.3	123.4	340.0
Western white pine:						
Sawtimber	1.9	6.7	23.8	0.4	--	32.8
Poletimber	--	0.6	0.2	--	0.1	0.9
Sapling and seedling	--	--	0.6	--	--	0.6
Nonstocked	--	--	--	--	--	--
Total	1.9	7.3	24.6	0.4	0.1	34.3
Lodgepole pine:						
Sawtimber	3.9	97.0	489.4	512.0	170.4	1,272.7
Poletimber	--	81.2	553.9	557.6	285.0	1,477.7
Sapling and seedling	--	33.9	64.7	141.0	87.9	327.5
Nonstocked	--	0.3	7.8	5.8	8.2	22.1
Total	3.9	212.4	1,115.8	1,216.4	551.5	3,100.0
Western larch:						
Sawtimber	22.6	170.2	65.2	11.5	0.7	270.2
Poletimber	2.4	33.3	57.4	--	--	93.1
Sapling and seedling	1.1	28.5	65.2	1.3	--	96.1
Nonstocked	--	6.2	3.2	--	--	9.4
Total	26.1	238.2	191.0	12.8	0.7	468.8
Western redcedar:						
Sawtimber	0.6	36.4	30.9	--	--	67.9
Poletimber	--	--	12.1	--	--	12.1
Sapling and seedling	--	2.4	7.1	--	--	9.5
Nonstocked	--	--	--	--	--	--
Total	0.6	38.8	50.1	--	--	89.5
Whitebark-limber pine:						
Sawtimber	--	--	7.7	21.8	45.3	74.8
Poletimber	--	--	--	--	27.5	27.5
Sapling and seedling	--	--	--	--	4.5	4.5
Nonstocked	--	--	--	--	--	--
Total	--	--	7.7	21.8	77.3	106.8

(con.)

Table 19. (Con.)

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
	Thousand acres					
Grand fir:						
Sawtimber	--	29.4	49.5	--	--	78.9
Poletimber	--	23.9	8.8	--	--	32.7
Sapling and seedling	--	0.4	24.0	1.3	--	25.7
Nonstocked	--	--	1.7	--	--	1.7
Total	--	53.7	84.0	1.3	--	139.0
Subalpine fir-spruce:						
Sawtimber	4.5	91.7	278.2	175.6	113.3	663.3
Poletimber	--	9.1	57.6	35.9	47.1	149.7
Sapling and seedling	--	11.4	99.1	43.2	22.6	176.3
Nonstocked	--	--	5.4	1.6	--	7.0
Total	4.5	112.2	440.3	256.3	183.0	996.3
Engelmann spruce:						
Sawtimber	--	41.8	61.7	28.8	14.4	146.7
Poletimber	--	5.0	2.3	8.3	0.8	16.4
Sapling and seedling	--	29.9	11.1	3.0	--	44.0
Nonstocked	--	--	2.1	--	--	2.1
Total	--	76.7	77.2	40.1	15.2	209.2
Other softwoods:						
Sawtimber	--	--	--	--	0.1	0.1
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	--	0.1	0.1
Aspen:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	--	--	--
Cottonwood:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	--	--	--
Other hardwoods:						
Sawtimber	--	--	--	1.7	3.4	5.1
Poletimber	--	--	--	1.1	--	1.1
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	2.8	3.4	6.2
All types:						
Sawtimber	34.7	924.8	2,021.5	1,353.3	660.9	4,995.2
Poletimber	2.4	191.1	802.9	770.2	398.6	2,165.2
Sapling and seedling	1.1	127.4	374.9	237.1	155.5	896.0
Nonstocked	--	8.9	59.8	21.7	15.0	105.4
Total	38.2	1,252.2	3,259.1	2,382.3	1,230.0	8,161.8

Table 20.--Area of other publicly owned commercial timberland in Montana by forest type, stand-size class, and productivity class, 1980

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
	- - - - - - - - - -		Thousand acres		- - - - - - - - - -	
Douglas-fir:						
Sawtimber	--	12.4	45.0	111.6	43.4	212.4
Poletimber	--	1.0	3.5	23.0	18.0	45.5
Sapling and seedling	--	0.4	6.8	18.5	11.9	37.6
Nonstocked	--	--	--	2.3	3.2	5.5
Total	--	13.8	55.3	155.4	76.5	301.0
Western hemlock:						
Sawtimber	--	--	(1)	--	--	(1)
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	(1)	--	--	(1)
Ponderosa pine:						
Sawtimber	1.4	5.1	10.9	27.1	72.0	116.5
Poletimber	--	(1)	1.5	3.6	17.0	22.1
Sapling and seedling	--	(1)	1.8	4.6	31.5	37.9
Nonstocked	--	--	0.1	0.5	1.6	2.2
Total	1.4	5.1	14.3	35.8	122.1	178.7
Western white pine:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	0.1	--	--	--	0.1
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	0.1	--	--	--	0.1
Lodgepole pine:						
Sawtimber	--	--	12.3	22.1	12.8	47.2
Poletimber	0.8	1.1	11.0	28.4	7.3	48.6
Sapling and seedling	--	3.3	0.4	7.0	6.1	16.8
Nonstocked	--	--	--	1.3	0.4	1.7
Total	0.8	4.4	23.7	58.8	26.6	114.3
Western larch:						
Sawtimber	0.1	1.5	6.7	16.8	1.4	26.5
Poletimber	--	--	2.2	1.2	--	3.4
Sapling and seedling	--	--	3.3	2.8	1.8	7.9
Nonstocked	--	--	--	0.6	--	0.6
Total	0.1	1.5	12.2	21.4	3.2	38.4
Western redcedar:						
Sawtimber	--	--	0.4	1.4	--	1.8
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	0.4	1.4	--	1.8
Whitebark-limber pine:						
Sawtimber	--	--	--	2.0	5.8	7.8
Poletimber	--	--	--	--	0.8	0.8
Sapling and seedling	--	--	0.4	--	1.4	1.8
Nonstocked	--	--	--	--	1.4	1.4
Total	--	--	0.4	2.0	9.4	11.8

(con.)

Table 20. (Con.)

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
	- - - - - - - - - - Thousand acres - - - - - - - - - -					
Grand fir:						
Sawtimber	--	2.8	4.4	2.8	--	10.0
Poletimber	--	--	1.4	--	--	1.4
Sapling and seedling	--	--	2.1	1.0	--	3.1
Nonstocked	--	--	--	--	--	--
Total	--	2.8	7.9	3.8	--	14.5
Subalpine fir-spruce:						
Sawtimber	--	1.4	10.7	16.7	4.4	33.2
Poletimber	--	--	0.7	1.9	1.7	4.3
Sapling and seedling	--	--	2.8	8.5	4.0	15.3
Nonstocked	--	--	0.1	([1])	--	0.1
Total	--	1.4	14.3	27.1	10.1	52.9
Engelmann spruce:						
Sawtimber	--	1.8	4.8	3.2	0.2	10.0
Poletimber	--	0.3	([1])	0.9	--	1.2
Sapling and seedling	--	--	--	1.7	0.6	2.3
Nonstocked	--	--	--	--	--	--
Total	--	2.1	4.8	5.8	0.8	13.5
Other softwoods:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	--	--	--
Aspen:						
Sawtimber	--	0.1	0.3	1.0	--	1.4
Poletimber	--	--	0.7	3.6	2.1	6.4
Sapling and seedling	--	--	0.6	0.6	1.4	2.6
Nonstocked	--	--	--	0.6	0.5	1.1
Total	--	0.1	1.6	5.8	4.0	11.5
Cottonwood:						
Sawtimber	--	--	0.5	4.8	12.9	18.2
Poletimber	--	--	--	0.3	0.9	1.2
Sapling and seedling	--	--	--	--	0.8	0.8
Nonstocked	--	--	--	--	0.4	0.4
Total	--	--	0.5	5.1	15.0	20.6
Other hardwoods:						
Sawtimber	--	--	--	0.1	--	0.1
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	([1])	--	([1])
Nonstocked	--	--	--	--	0.1	0.1
Total	--	--	--	0.1	0.1	0.2
All types:						
Sawtimber	1.5	25.1	96.0	209.6	152.9	485.1
Poletimber	0.8	2.5	21.0	62.9	47.8	135.0
Sapling and seedling	--	3.7	18.2	44.7	59.5	126.1
Nonstocked	--	--	.2	5.3	7.6	13.1
Total	2.3	31.3	135.4	322.5	267.8	759.3

[1]Less than 0.5 thousand acres.

Table 21.--Area of forest industry owned commercial timberland in Montana by forest type, stand-size class, and productivity class, 1980

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
	- - - - - - - - - Thousand acres - - - - - - - - -					
Douglas-fir:						
Sawtimber	--	33.5	104.8	327.2	74.9	540.4
Poletimber	--	0.4	2.7	55.8	28.9	87.8
Sapling and seedling	--	0.9	11.9	79.2	50.9	142.9
Nonstocked	--	--	--	7.7	4.6	12.3
Total	--	34.8	119.4	469.9	159.3	783.4
Western hemlock:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	4.3	--	--	--	4.3
Nonstocked	--	--	--	--	--	--
Total	--	4.3	--	--	--	4.3
Ponderosa pine:						
Sawtimber	--	0.5	29.9	40.5	13.9	84.8
Poletimber	--	--	0.5	2.8	2.9	6.2
Sapling and seedling	--	0.1	2.7	22.6	10.1	35.5
Nonstocked	--	--	4.6	5.8	5.0	15.4
Total	--	0.6	37.7	71.7	31.9	141.9
Western white pine:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	--	--	--
Lodgepole pine:						
Sawtimber	--	7.0	17.5	60.1	17.2	101.8
Poletimber	--	4.3	27.6	92.6	14.7	139.2
Sapling and seedling	--	--	2.8	23.5	35.4	61.7
Nonstocked	--	--	--	1.4	2.6	4.0
Total	--	11.3	47.9	177.6	69.9	306.7
Western larch:						
Sawtimber	--	4.3	29.6	33.3	2.7	69.9
Poletimber	--	--	--	2.7	--	2.7
Sapling and seedling	--	--	6.9	23.0	12.6	42.5
Nonstocked	--	--	--	--	--	--
Total	--	4.3	36.5	59.0	15.3	115.1
Western redcedar:						
Sawtimber	--	--	8.5	7.1	--	15.6
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	8.5	7.1	--	15.6
Whitebark-limber pine:						
Sawtimber	--	--	--	3.1	10.4	13.5
Poletimber	--	--	--	--	1.1	1.1
Sapling and seedling	--	--	--	(1)	1.7	1.7
Nonstocked	--	--	--	--	--	--
Total	--	--	--	3.1	13.2	16.3

(con.)

Table 21. (Con.)

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
	- - - - - - - - - - Thousand acres - - - - - - - - - -					
Grand fir:						
Sawtimber	4.3	--	21.6	13.0	--	38.9
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	4.4	4.4	0.2	--	9.0
Nonstocked	--	--	--	--	--	--
Total	4.3	4.4	26.0	13.2	--	47.9
Subalpine fir-spruce:						
Sawtimber	--	12.5	15.1	27.7	3.8	59.1
Poletimber	--	--	7.1	4.8	0.4	12.3
Sapling and seedling	--	--	2.7	30.7	9.5	42.9
Nonstocked	--	--	--	1.3	--	1.3
Total	--	12.5	24.9	64.5	13.7	115.6
Engelmann spruce:						
Sawtimber	--	--	25.2	9.2	1.1	35.5
Poletimber	--	--	--	4.3	--	4.3
Sapling and seedling	--	--	2.8	0.4	0.9	4.1
Nonstocked	--	--	--	--	--	--
Total	--	--	28.0	13.9	2.0	43.9
Other softwoods:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	--	--	--
Aspen:						
Sawtimber	--	--	--	1.2	--	1.2
Poletimber	--	--	0.1	[1]	[1]	0.1
Sapling and seedling	--	--	0.1	1.0	2.5	3.6
Nonstocked	--	--	--	--	[1]	--
Total	--	--	0.2	2.2	2.5	4.9
Cottonwood:						
Sawtimber	--	--	3.3	1.7	0.6	5.6
Poletimber	--	--	--	[1]	[1]	[1]
Sapling and seedling	--	--	--	--	0.1	0.1
Nonstocked	--	--	--	--	--	--
Total	--	--	3.3	1.7	0.7	5.7
Other hardwoods:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	--	--	--
All types:						
Sawtimber	4.3	57.8	255.5	524.1	124.6	966.3
Poletimber	--	4.7	38.0	163.0	48.0	253.7
Sapling and seedling	--	9.7	34.3	180.6	123.7	348.3
Nonstocked	--	--	4.6	16.2	12.2	33.0
Total	4.3	72.2	332.4	883.9	308.5	1,601.3

[1]Less than 0.5 thousand acres.

Table 22.--Area of privately owned commercial timberland in Montana by forest type, stand-size class, and productivity class, 1980

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
	- - - - - - - - - - Thousand acres - - - - - - - - - -					
Douglas-fir:						
Sawtimber	--	13.0	67.9	411.7	265.8	758.4
Poletimber	--	2.1	12.0	101.2	97.7	213.0
Sapling and seedling	--	1.0	23.4	93.9	95.4	213.7
Nonstocked	--	--	--	3.8	17.1	20.9
Total	--	16.1	103.3	610.6	476.0	1,206.0
Western hemlock:						
Sawtimber	--	--	3.8	--	--	3.8
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	3.8	--	--	3.8
Ponderosa pine:						
Sawtimber	--	12.5	45.5	146.9	425.2	630.1
Poletimber	--	4.4	2.0	11.5	83.1	101.0
Sapling and seedling	--	0.6	2.6	14.7	210.2	228.1
Nonstocked	--	--	0.7	1.7	14.9	17.3
Total	--	17.5	50.8	174.8	733.4	976.5
Western white pine:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	3.9	--	--	--	3.9
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	3.9	--	--	--	3.9
Lodgepole pine:						
Sawtimber	--	--	27.4	61.9	35.3	124.6
Poletimber	4.2	7.9	25.8	56.9	55.6	150.4
Sapling and seedling	--	4.2	13.7	10.7	30.1	58.7
Nonstocked	--	--	--	6.6	4.2	10.8
Total	4.2	12.1	66.9	136.1	125.2	344.5
Western larch:						
Sawtimber	4.2	3.9	16.3	13.7	--	38.1
Poletimber	--	--	--	6.8	--	6.8
Sapling and seedling	--	--	--	5.9	--	5.9
Nonstocked	--	--	--	--	--	--
Total	4.2	3.9	16.3	26.4	--	50.8
Western redcedar:						
Sawtimber	--	--	15.5	--	--	15.5
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	15.5	--	--	15.5
Whitebark-limber pine:						
Sawtimber	--	--	--	8.4	22.0	30.4
Poletimber	--	--	--	--	4.0	4.0
Sapling and seedling	--	--	3.1	--	8.1	11.2
Nonstocked	--	--	--	--	1.1	1.1
Total	--	--	3.1	8.4	35.2	46.7

(con.)

Table 22. (Con.)

Forest type and stand-size class	Productivity class					Total acres
	165+	120-164	85-119	50-84	20-49	
	Thousand acres					
Grand fir:						
Sawtimber	--	--	7.9	--	--	7.9
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	2.0	--	2.0
Nonstocked	--	--	--	--	--	--
Total	--	--	7.9	2.0	--	9.9
Subalpine fir-spruce:						
Sawtimber	--	--	3.9	37.4	2.4	43.7
Poletimber	--	--	--	10.0	1.8	11.8
Sapling and seedling	--	--	--	12.0	14.2	26.2
Nonstocked	--	--	3.5	2.6	--	6.1
Total	--	--	7.4	62.0	18.4	87.8
Engelmann spruce:						
Sawtimber	--	6.5	10.4	9.8	2.4	29.1
Poletimber	--	2.6	3.8	3.9	--	10.3
Sapling and seedling	--	--	--	5.7	2.2	7.9
Nonstocked	--	--	--	--	--	--
Total	--	9.1	14.2	19.4	4.6	47.3
Other softwoods:						
Sawtimber	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	--	--	--
Aspen:						
Sawtimber	--	4.1	6.9	6.8	--	17.8
Poletimber	--	3.7	5.2	17.6	17.2	43.7
Sapling and seedling	--	--	0.6	6.1	19.1	25.8
Nonstocked	--	--	--	3.0	3.2	6.2
Total	--	7.8	12.7	33.5	39.5	93.5
Cottonwood:						
Sawtimber	--	--	3.4	31.5	97.5	132.4
Poletimber	--	--	--	3.2	8.9	12.1
Sapling and seedling	--	--	--	--	8.5	8.5
Nonstocked	--	--	--	--	3.6	3.6
Total	--	--	3.4	34.7	118.5	156.6
Other hardwoods:						
Sawtimber	--	--	--	1.3	--	1.3
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	4.1	--	4.1
Nonstocked	--	--	--	--	0.7	0.7
Total	--	--	--	5.4	0.7	6.1
All types:						
Sawtimber	4.2	40.0	208.9	729.4	850.6	1,833.1
Poletimber	4.2	24.6	48.8	211.1	268.3	557.0
Sapling and seedling	--	5.8	43.4	155.1	387.8	592.1
Nonstocked	--	--	4.2	17.7	44.8	66.7
Total	8.4	70.4	305.3	1,113.3	1,551.5	3,048.9

Table 23.--Area of productive deferred, productive reserved, and other forest land in Montana by land class, ownership class, and forest type, 1980

Land class	Forest type																
	Douglas-fir	Western hemlock	Ponderosa pine	Western white pine	Lodgepole pine	Western larch	Western redcedar	Whitebark-limber pine	Grand fir	Subalpine fir-spruce	Engel-mann spruce	Pinyon-juniper	Other soft-woods	Aspen	Cotton-wood	Other hard-woods	All types
	Thousand acres																
Productive deferred area:																	
National Forest	167.7	3.0	17.3	1.8	318.9	31.2	0.7	42.0	2.0	94.6	24.6	--	--	4.3	--	0.6	708.7
Total	167.7	3.0	17.3	1.8	318.9	31.2	0.7	42.0	2.0	94.6	24.6	--	--	4.3	--	0.6	708.7
Productive reserved area:																	
National Forest	215.0	15.5	49.2	2.5	643.1	24.3	0.7	198.1	0.3	124.0	157.1	--	--	9.7	--	0.4	1,439.9
Other public	8.9	--	90.1	--	2.1	0.2	--	--	0.1	0.1	0.1	--	0.1	2.4	8.6	0.1	112.8
Forest industry	0.4	--	(1)	--	0.7	(1)	--	0.7	(1)	(1)	(1)	--	(1)	--	--	(1)	1.8
Farmer and other private	2.2	--	2.4	--	0.6	0.3	--	--	0.1	0.1	0.3	--	0.5	0.1	0.4	0.2	7.2
Total	226.5	15.5	141.7	2.5	646.5	24.8	0.7	198.8	0.5	124.2	157.5	--	0.6	12.2	9.0	0.7	1,561.7
Other forest land area:																	
Reserved:																	
National Forest	103.7	16.3	7.6	0.2	171.0	8.5	0.1	482.2	0.1	127.1	62.1	--	--	2.9	--	--	981.8
Other public	1.7	--	24.4	--	0.5	--	--	--	--	0.1	--	--	0.8	0.7	3.3	0.1	31.6
Forest industry	--	--	--	--	--	--	--	0.7	--	--	--	--	--	--	--	--	0.7
Farmer and other private	(1)	--	0.3	--	(1)	--	--	--	--	0.1	(1)	--	--	(1)	0.1	--	0.5
Total	105.4	16.3	32.3	0.2	171.5	8.5	0.1	482.9	0.1	127.3	62.1	--	0.8	3.6	3.4	0.1	1,014.6
Nonreserved:																	
National Forest	500.3	11.7	73.3	1.8	716.8	31.2	1.3	719.4	3.4	236.2	202.1	--	--	25.7	--	1.8	2,525.0
Other public	4.5	--	89.3	--	1.2	--	--	11.1	--	0.8	--	14.1	19.9	2.4	1.8	4.6	149.7
Forest industry	2.0	--	0.7	--	0.5	--	--	2.8	--	0.4	--	1.6	2.3	1.1	--	0.8	12.2
Farmer and other private	45.9	--	330.0	--	8.0	--	--	62.7	--	2.5	--	72.6	64.6	45.4	17.6	33.5	682.8
Total	552.7	11.7	493.3	1.8	726.5	31.2	1.3	796.0	3.4	239.9	202.1	88.3	86.8	74.6	19.4	40.7	3,369.7
Total other forest land:																	
National Forest	604.0	28.0	80.9	2.0	887.8	39.7	1.4	1,201.6	3.5	363.3	264.2	--	--	28.6	--	1.8	3,506.8
Other public	6.2	--	113.7	--	1.7	--	--	11.1	--	0.9	--	14.1	20.7	3.1	5.1	4.7	181.3
Forest industry	2.0	--	0.7	--	0.5	--	--	3.5	--	0.4	--	1.6	2.3	1.1	--	0.8	12.9
Farmer and other private	45.9	--	330.3	--	8.0	--	--	62.7	--	2.6	(1)	72.6	64.6	45.4	17.7	33.5	683.3
Total	658.1	28.0	525.6	2.0	898.0	39.7	1.4	1,278.9	3.5	367.2	264.2	88.3	87.6	78.2	22.8	40.8	4,384.3
Total all areas:																	
National Forest	986.7	46.5	147.4	6.3	1,849.8	95.2	2.8	1,441.7	5.8	581.9	445.9	--	--	42.6	--	2.8	5,655.4
Other public	15.1	--	203.8	--	3.8	0.2	--	11.1	0.1	1.0	0.1	14.1	20.8	5.5	13.7	4.8	294.1
Forest industry	2.4	--	0.7	--	1.2	(1)	--	4.2	(1)	0.4	(1)	1.6	2.3	1.1	--	0.8	14.7
Farmer and other private	48.1	--	332.7	--	8.6	0.3	--	62.7	0.1	2.7	0.3	72.6	65.1	45.5	18.1	33.7	690.5
Total	1,052.3	46.5	684.6	6.3	1,863.4	95.7	2.8	1,519.7	6.0	586.0	446.3	88.3	88.2	94.7	31.8	42.1	6,654.7

[1]Less than 0.05 thousand acres.

Table 24.--Net volume of growing stock on commercial timberland in Montana by species and diameter class, 1980

Species	Diameter class (inches at breast height)													All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Million cubic feet													
Douglas-fir	546.7	904.8	1,044.7	1,048.6	919.0	801.8	636.0	480.6	332.6	241.6	174.8	104.6	211.6	7,447.4
Ponderosa pine	93.6	188.2	241.3	277.4	255.9	217.1	180.2	136.2	124.0	84.8	91.4	65.3	212.2	2,167.6
Western white pine	7.5	14.8	20.2	24.6	30.3	18.7	18.2	24.3	13.9	15.3	7.5	7.3	20.2	222.8
Lodgepole pine	1,811.9	2,601.4	1,873.4	1,141.5	565.2	227.9	88.8	40.3	10.5	6.4	1.2	1.1	0.8	8,370.4
Whitebark-limber pine	70.9	138.1	151.3	141.8	101.2	64.2	41.0	26.1	14.2	4.9	7.0	2.2	4.5	767.4
Western larch	121.9	205.6	219.7	205.3	203.8	192.5	180.5	171.4	154.1	143.1	103.1	73.8	203.9	2,178.7
Grand fir	45.2	77.1	71.9	68.0	50.1	42.3	39.0	20.9	11.6	12.3	4.6	4.2	4.1	451.3
Subalpine fir	242.9	337.4	326.0	241.5	166.4	120.8	61.8	40.2	29.0	12.9	4.4	1.2	3.4	1,587.9
Engelmann spruce	110.1	173.1	226.5	258.3	246.4	221.4	186.3	148.4	130.4	75.4	61.3	28.3	91.2	1,957.1
Western hemlock	18.8	46.0	33.6	37.3	29.2	32.4	25.1	17.5	18.4	19.4	12.6	9.1	15.2	314.6
Western redcedar	22.3	33.1	27.8	32.6	26.3	19.0	14.0	18.0	9.5	8.6	11.0	10.8	49.9	282.9
Other softwoods	--	--	--	0.6	--	--	--	--	--	--	--	--	--	0.6
Total softwoods	3,091.8	4,719.6	4,236.4	3,477.5	2,593.8	1,958.1	1,470.9	1,123.9	848.2	624.7	478.9	307.9	817.0	25,748.7
Aspen	28.2	37.0	39.1	25.3	9.2	2.4	1.9	1.9	0.5	0.7	0.1	0.9	0.4	147.6
Cottonwood	4.1	6.7	10.2	16.0	22.9	21.4	22.7	24.5	25.4	13.7	9.5	12.8	31.9	221.8
Other hardwoods	11.2	11.2	9.3	5.2	5.5	2.7	0.4	1.2	--	0.3	0.2	--	0.7	47.9
Total hardwoods	43.5	54.9	58.6	46.5	37.6	26.5	25.0	27.6	25.9	14.7	9.8	13.7	33.0	417.3
All species	3,135.3	4,774.5	4,295.0	3,524.0	2,631.4	1,984.6	1,495.9	1,151.5	874.1	639.4	488.7	321.6	850.0	26,166.0

Table 25.--Net volume of sawtimber on commercial timberland in Montana by species and diameter class, 1980

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Million board feet, International ¼-inch rule											
Douglas-fir	3,436.5	4,570.0	4,231.1	3,876.2	3,186.0	2,456.6	1,729.4	1,279.3	944.3	576.6	1,200.7	27,486.7
Ponderosa pine	639.9	1,111.8	1,228.7	1,117.1	972.9	753.9	692.0	482.8	503.1	362.8	1,255.2	9,120.2
Western white pine	84.1	128.8	162.3	99.0	97.8	132.9	77.9	89.8	43.0	44.4	124.8	1,084.8
Lodgepole pine	7,663.6	6,023.4	3,009.0	1,206.6	464.4	200.1	54.3	31.1	6.1	5.5	4.8	18,668.9
Whitebark-limber pine	578.3	703.5	501.0	315.6	205.7	130.6	74.3	26.7	35.5	11.7	21.3	2,604.2
Western larch	925.1	1,106.8	1,094.4	1,034.1	969.5	914.2	838.9	794.7	582.6	415.5	1,156.2	9,832.0
Grand fir	284.1	358.1	276.3	240.7	225.9	124.5	65.7	85.9	29.9	28.2	34.8	1,754.1
Subalpine fir	1,284.7	1,243.8	847.5	616.2	321.1	206.7	152.4	81.1	24.7	8.2	22.3	4,808.7
Engelmann spruce	932.6	1,357.2	1,283.0	1,154.0	969.0	784.4	697.3	417.6	353.9	169.9	570.5	8,689.4
Western hemlock	117.7	174.7	151.5	190.0	150.1	110.4	116.5	125.0	82.7	62.0	120.9	1,401.5
Western redcedar	122.9	187.4	159.4	117.4	86.9	111.4	69.3	71.8	87.9	88.7	455.1	1,558.2
Other softwoods	--	2.3	--	--	--	--	--	--	--	--	--	2.3
Total softwoods	16,069.5	16,967.8	12,944.2	9,966.9	7,649.3	5,925.7	4,568.0	3,485.8	2,693.7	1,773.5	4,966.6	87,011.0
Aspen	XXXXX	130.8	49.2	12.1	9.5	9.0	2.2	3.5	0.3	4.2	2.2	223.0
Cottonwood	XXXXX	81.3	115.2	105.5	109.2	114.2	115.5	61.5	42.9	57.8	147.8	950.9
Other hardwoods	XXXXX	26.0	27.1	13.6	1.8	6.0	--	1.1	0.8	--	3.3	79.7
Total hardwoods	XXXXX	238.1	191.5	131.2	120.5	129.2	117.7	66.1	44.0	62.0	153.3	1,253.6
All species	16,069.5	17,205.9	13,135.7	10,098.1	7,769.8	6,054.9	4,685.7	3,551.9	2,737.7	1,835.5	5,119.9	88,264.6

Table 26.--Net annual growth of growing stock and sawtimber on commercial timberland in Montana by ownership class and species, 1979

Species	Ownership				Total
	National Forest	Other public	Forest industry	Farmer and other private	
	GROWING STOCK				
	Thousand cubic feet				
Douglas-fir	72,291	8,181	17,890	31,530	129,892
Ponderosa pine	14,638	4,237	4,209	20,445	43,529
Western white pine	3,685	155	526	368	4,734
Lodgepole pine	125,871	7,252	14,668	18,887	166,678
Whitebark-limber pine	6,440	186	458	1,284	8,368
Western larch	23,850	2,399	4,886	3,583	34,718
Grand fir	11,562	565	2,079	323	14,529
Subalpine fir	21,059	1,084	3,226	2,975	28,344
Engelmann spruce	25,876	1,076	2,124	3,696	32,772
Western hemlock	8,500	58	586	423	9,567
Western redcedar	6,160	166	657	346	7,329
Other softwoods	14	--	--	--	14
Total softwoods	319,946	25,359	51,309	83,860	480,474
Aspen	874	265	223	2,520	3,882
Cottonwood	--	482	188	3,263	3,933
Other hardwoods	1,014	373	84	554	2,025
Total hardwoods	1,888	1,120	495	6,337	9,840
All species	321,834	26,479	51,804	90,197	490,314
	SAWTIMBER				
	Thousand board feet, International ¼-inch rule				
Douglas-fir	250,189	35,565	79,735	140,861	506,350
Ponderosa pine	66,504	19,947	25,315	95,301	207,067
Western white pine	17,822	700	2,728	654	21,904
Lodgepole pine	186,414	14,591	31,777	49,838	282,620
Whitebark-limber pine	19,232	669	1,537	5,158	26,596
Western larch	90,405	8,928	14,671	16,441	130,445
Grand fir	34,792	2,121	7,963	2,387	47,263
Subalpine fir	42,516	3,418	4,013	4,284	54,231
Engelmann spruce	91,841	4,286	10,825	13,434	120,386
Western hemlock	29,998	52	967	2,515	33,532
Western redcedar	20,633	709	1,360	2,990	25,692
Other softwoods	59	--	--	--	59
Total softwoods	850,405	90,986	180,891	333,863	1,456,145
Aspen	734	766	335	9,210	11,045
Cottonwood	--	2,141	379	16,796	19,316
Other hardwoods	1,841	807	100	221	2,969
Total hardwoods	2,575	3,714	814	26,227	33,330
All species	852,980	94,700	181,705	360,090	1,489,475

Table 27.--Net annual growth of growing stock on commercial timberland in Montana by species and diameter class, 1979

Species	Diameter class (inches at breast height)													All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	17.0-28.9	29.0+	
	Thousand cubic feet													
Douglas-fir	32,053	21,434	19,854	17,640	13,472	10,268	6,496	4,445	2,125	1,262	1,076	313	-546	129,892
Ponderosa pine	7,701	5,996	6,392	6,146	5,251	3,420	2,564	1,696	1,341	920	790	419	893	43,529
Western white pine	580	605	467	744	940	296	237	355	121	71	-51	122	247	4,734
Lodgepole pine	81,515	44,597	23,621	10,844	4,811	288	475	379	104	15	14	11	4	166,678
Whitebark-limber pine	2,374	1,708	1,576	990	711	516	306	66	12	31	40	11	27	8,368
Western larch	8,293	6,417	5,200	3,973	3,713	2,628	1,728	989	370	463	268	65	611	34,718
Grand fir	3,881	3,422	2,214	1,783	937	836	933	43	210	222	77	64	-93	14,529
Subalpine fir	13,242	7,226	2,449	2,706	1,626	1,029	134	-86	55	128	-11	8	-162	28,344
Engelmann spruce	7,077	4,754	4,744	4,134	3,576	2,958	1,893	1,207	844	625	355	114	491	32,772
Western hemlock	1,811	2,268	1,360	1,148	781	681	466	337	148	296	168	121	-18	9,567
Western redcedar	1,849	1,142	814	705	576	464	173	182	132	199	227	211	655	7,329
Other softwoods	2	--	--	12	--	--	--	--	--	--	--	--	--	14
Total softwoods	160,378	99,569	68,691	50,825	36,394	23,384	15,405	9,613	5,462	4,232	2,953	1,459	2,109	480,474
Aspen	1,318	1,083	905	570	168	-24	23	-47	-60	-53	([1])	8	-9	3,882
Cottonwood	287	398	326	400	369	488	382	430	328	227	159	229	-90	3,933
Other hardwoods	837	453	340	169	142	51	6	13	--	2	1	--	11	2,025
Total hardwoods	2,442	1,934	1,571	1,139	679	515	411	396	268	176	160	237	-88	9,840
All species	162,820	101,503	70,262	51,964	37,073	23,899	15,816	10,009	5,730	4,408	3,113	1,696	2,021	490,314

[1]Less than 0.05 thousand cubic feet.

Table 28.--Net annual growth of sawtimber on commerical timberland in Montana by species and diameter class, 1979

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand board feet, International ¼-inch rule											
Douglas-fir	191,278	100,780	73,148	56,991	35,883	23,699	12,203	7,653	6,450	1,515	-3,250	506,350
Ponderosa pine	60,004	40,492	33,041	21,038	15,750	9,825	7,561	5,777	4,536	2,700	6,343	207,067
Western white pine	3,266	4,612	5,431	1,769	1,351	2,115	854	323	-509	881	1,811	21,904
Lodgepole pine	190,841	57,705	25,856	2,876	2,386	2,158	506	94	92	80	26	282,620
Whitebark-limber pine	12,030	5,926	3,461	2,725	1,430	430	60	164	204	67	99	26,596
Western larch	38,479	24,589	21,323	16,275	10,712	6,135	3,736	3,107	1,813	81	4,195	130,445
Grand fir	20,249	11,226	5,418	3,800	4,131	99	911	1,078	421	329	-399	47,263
Subalpine:fir	25,285	14,638	7,545	6,493	362	-2	244	686	-62	46	-1,004	54,231
Engelmann spruce	33,352	19,951	18,703	15,465	9,963	6,576	5,865	4,223	2,652	600	3,036	120,386
Western hemlock	9,734	6,187	4,178	3,178	2,655	2,282	1,138	2,152	1,247	881	-100	33,532
Western redcedar	6,961	3,881	2,816	2,311	802	1,031	659	1,007	1,115	1,039	4,070	25,692
Other softwoods	--	59	--	--	--	--	--	--	--	--	--	59
Total softwoods	591,479	290,046	200,920	132,921	85,425	54,348	33,737	26,264	17,959	8,219	14,827	1,456,145
Aspen	XXXXX	10,990	857	-123	105	-241	-288	-249	1	34	-41	11,045
Cottonwood	XXXXX	8,342	1,722	2,154	1,583	1,707	1,326	986	726	1,085	-315	19,316
Other hardwoods	XXXXX	1,656	865	263	25	74	--	7	9	--	70	2,969
Total hardwoods	XXXXX	20,988	3,444	2,294	1,713	1,540	1,038	744	736	1,119	-286	33,330
All species	591,479	311,034	204,364	135,215	87,138	55,888	34,775	27,008	18,695	9,338	14,541	1,489,475

Table 29.--Annual mortality of growing stock on commercial timberland in Montana by species and diameter class, 1979

Species	Diameter class (inches at breast height)													All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand cubic feet													
Douglas-fir	3,678	3,278	3,836	2,779	2,153	1,617	1,883	1,151	1,023	901	444	378	1,619	24,740
Ponderosa pine	449	868	891	851	260	568	258	205	248	42	154	129	2,385	7,308
Western white pine	153	163	302	118	78	144	124	105	73	161	101	--	--	1,522
Lodgepole pine	8,402	11,761	7,872	5,413	2,605	2,006	423	27	--	45	--	--	--	38,554
Whitebark-limber pine	491	591	255	542	316	80	43	108	69	4	30	--	2	2,531
Western larch	971	599	693	846	281	479	625	707	651	465	310	260	540	7,427
Grand fir	102	256	538	468	561	301	36	381	--	--	--	--	150	2,793
Subalpine fir	1,912	2,498	3,390	1,988	1,436	1,057	606	506	194	--	48	--	172	13,807
Engelmann spruce	548	480	443	883	711	451	577	632	435	58	205	130	251	5,804
Western hemlock	46	--	--	20	--	4	1	4	80	--	--	--	205	360
Western redcedar	4	61	--	161	69	53	91	106	--	--	--	--	--	545
Other softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	16,756	20,555	18,220	14,069	8,470	6,760	4,667	3,932	2,773	1,676	1,292	897	5,324	105,391
Aspen	387	145	142	--	--	58	--	66	63	58	--	--	16	935
Cottonwood	21	42	161	116	227	--	10	77	125	12	--	--	482	1,273
Other hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	408	187	303	116	227	58	10	143	188	70	--	--	498	2,208
All species	17,164	20,742	18,523	14,185	8,697	6,818	4,677	4,075	2,961	1,746	1,292	897	5,822	107,599

Table 30.--Annual mortality of sawtimber on commercial timberland in Montana by species and diameter class, 1979

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand board feet, International ¼-inch rule											
Douglas-fir	11,850	12,787	10,555	8,518	10,302	6,483	6,031	5,222	2,627	2,448	10,011	86,834
Ponderosa pine	2,517	3,671	1,363	2,990	1,436	1,141	1,431	251	917	793	17,199	33,709
Western white pine	937	657	425	832	755	668	406	989	752	--	--	6,421
Lodgepole pine	32,809	32,101	15,119	11,574	2,288	143	--	248	--	--	--	94,282
Whitebark-limber pine	1,077	3,077	1,713	468	238	639	403	23	203	--	8	7,849
Western larch	2,959	4,701	1,670	2,809	3,657	4,102	3,800	2,962	1,969	1,835	3,404	33,868
Grand fir	2,227	2,597	3,099	1,718	180	1,872	--	--	--	--	691	12,384
Subalpine fir	13,838	10,860	7,962	5,858	3,757	2,295	1,132	--	274	--	1,073	47,049
Engelmann spruce	2,284	4,999	4,079	2,555	3,339	3,569	2,436	358	1,287	867	1,509	27,282
Western hemlock	1	87	--	20	3	21	573	--	--	--	1,151	1,856
Western redcedar	--	1,005	348	262	559	520	--	--	--	--	--	2,694
Other softwoods	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	70,499	76,542	46,333	37,604	26,514	21,453	16,212	10,053	8,029	5,943	35,046	354,228
Aspen	XXXXX	--	--	295	--	322	304	273	--	--	73	1,267
Cottonwood	XXXXX	602	1,141	--	48	359	560	53	--	--	2,206	4,969
Other hardwoods	XXXXX	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	XXXXX	602	1,141	295	48	681	864	326	--	--	2,279	6,236
All species	70,499	77,144	47,474	37,899	26,562	22,134	17,076	10,379	8,029	5,943	37,325	360,464

Table 31.--Annual mortality of growing stock and sawtimber on commercial timberland in Montana by cause of death and species, 1979

Species	Cause of Death								Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	
					GROWING STOCK				
					Thousand cubic feet				
Douglas-fir	3,134	3,575	1,370	82	6,543	720	3,243	6,073	24,740
Ponderosa pine	3,258	286	243	47	1,261	65	148	2,000	7,308
Western white pine	--	1,024	--	--	--	--	132	366	1,522
Lodgepole pine	6,532	2,141	895	601	6,599	1,402	878	19,506	38,554
Whitebark-limber pine	--	325	--	--	683	--	--	1,523	2,531
Western larch	1,228	1,895	312	--	2,026	--	158	1,808	7,427
Grand fir	144	1,845	--	--	223	--	132	449	2,793
Subalpine fir	1,977	3,650	205	--	1,853	--	--	6,122	13,807
Engelmann spruce	299	162	--	--	2,778	--	1,361	1,204	5,804
Western hemlock	--	--	--	--	--	--	--	360	360
Western redcedar	--	219	--	--	--	--	--	326	545
Total softwoods	16,572	15,122	3,025	730	21,966	2,187	6,052	39,737	105,391
Aspen	--	119	--	9	146	31	--	630	935
Cottonwood	--	350	32	125	65	--	14	687	1,273
Total hardwoods	--	469	32	134	211	31	14	1,317	2,208
All species	16,572	15,591	3,057	864	22,177	2,218	6,066	41,054	107,599
					SAWTIMBER				
					Thousand board feet, International ¼-inch rule				
Douglas-fir	10,129	11,971	1,580	535	32,681	428	3,806	25,704	86,834
Ponderosa pine	18,710	1,402	1,440	95	1,989	--	415	9,658	33,709
Western white pine	--	3,410	--	--	--	--	817	2,194	6,421
Lodgepole pine	20,213	5,682	702	2,601	18,545	--	1,427	45,112	94,282
Whitebark-limber pine	--	1,844	--	--	3,340	--	--	2,665	7,849
Western larch	5,464	10,691	1,737	--	9,813	--	--	6,163	33,868
Grand fir	--	9,007	--	--	839	--	683	1,855	12,384
Subalpine fir	6,108	19,704	--	--	6,748	--	--	14,489	47,049
Engelmann spruce	1,303	979	--	--	16,253	--	2,451	6,296	27,282
Western hemlock	--	--	--	--	--	--	--	1,856	1,856
Western redcedar	--	1,097	--	--	--	--	--	1,597	2,694
Total softwoods	61,927	65,787	5,459	3,231	90,208	428	9,599	117,589	354,228
Aspen	--	322	--	--	377	--	--	568	1,267
Cottonwood	--	1,602	150	560	307	--	--	2,350	4,969
Total hardwoods	--	1,924	150	560	684	--	--	2,918	6,236
All species	61,927	67,711	5,609	3,791	90,892	428	9,599	120,507	360,464

Table 32.--Number of cull and salvable dead trees on State and private commercial timberland in Montana by ownership class, and softwoods and hardwoods, 1980

Ownership class and species group	Cull trees			Salvable dead trees	All dead trees
	Sound	Rotten	Total		
	Thousand trees				
State:					
Softwoods	2,574	1,259	3,833	10,392	14,225
Hardwoods	76	108	184	467	651
Total	2,650	1,367	4,017	10,859	14,876
Forest industry:					
Softwoods	4,718	2,527	7,245	24,109	31,354
Hardwoods	148	115	263	42	305
Total	4,866	2,642	7,508	24,151	31,659
Farmer and other private:					
Softwoods	19,247	2,570	21,817	36,649	58,466
Hardwoods	1,376	1,390	2,766	3,518	6,284
Total	20,623	3,960	24,583	40,167	64,750
Total:					
Softwoods	26,539	6,356	32,895	71,150	104,045
Hardwoods	1,600	1,613	3,213	4,027	7,240
Total	28,139	7,969	36,108	75,177	111,285

Table 33.--Net volume of growing stock on State and private commercial timberland in Montana by ownership class, forest type, and stand-size class, 1980

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
		Thousand cubic feet				
State:						
	Douglas-fir	407,572	59,399	22,486	529	489,986
	Western hemlock	--	--	--	--	--
	Ponderosa pine	104,176	9,005	10,292	395	123,868
	Western white pine	--	37	--	--	37
	Lodgepole pine	129,237	126,232	12,363	41	267,873
	Western larch	76,662	7,256	4,226	156	88,300
	Western redcedar	6,906	--	--	--	6,906
	Whitebark-limber pine	14,168	487	391	95	15,141
	Grand fir	30,025	1,211	1,277	--	32,513
	Subalpine fir-spruce	93,232	6,831	4,843	54	104,960
	Engelmann spruce	37,241	2,272	581	--	40,094
	Aspen	1,898	5,546	1,357	31	8,832
	Cottonwood	16,666	673	306	32	17,677
	Other hardwoods	144	--	5	15	164
	All types	917,927	218,949	58,127	1,348	1,196,351
Forest industry:						
	Douglas-fir	1,046,663	120,436	71,312	791	1,239,202
	Western hemlock	--	--	--	--	--
	Ponderosa pine	135,640	5,385	12,836	3,552	157,413
	Western white pine	--	--	--	--	--
	Lodgepole pine	265,448	384,842	24,859	274	675,423
	Western larch	179,024	5,414	23,179	--	207,617
	Western redcedar	68,364	--	--	--	68,364
	Whitebark-limber pine	38,636	702	200	--	39,538
	Grand fir	97,776	--	3,227	--	101,003
	Subalpine fir-spruce	178,226	24,626	14,273	316	217,441
	Engelmann spruce	106,834	7,940	509	--	115,283
	Aspen	378	145	1,079	4	1,606
	Cottonwood	12,147	13	35	--	12,195
	Other hardwoods	--	--	--	--	--
	All types	2,129,136	549,503	151,509	4,937	2,835,085
Farmer and other private:	Douglas-fir	1,235,469	266,605	86,365	1,272	1,589,711
	Western hemlock	5,768	--	--	--	5,768
	Ponderosa pine	678,983	78,586	99,218	2,061	858,848
	Western white pine	--	4,045	--	--	4,045
	Lodgepole pine	307,699	369,748	37,961	605	716,013
	Western larch	112,943	11,522	3,874	--	128,339
	Western redcedar	23,449	--	--	--	23,449
	Whitebark-limber pine	60,292	2,394	2,135	139	64,960
	Grand fir	12,999	--	461	--	13,460
	Subalpine fir-spruce	118,314	21,369	9,645	2,635	151,963
	Engelmann spruce	68,296	23,091	4,386	--	95,773
	Aspen	32,480	59,642	11,315	224	103,661
	Cottonwood	157,801	7,577	3,162	279	168,819
	Other hardwoods	2,020	--	1,701	138	3,859
	All types	2,816,513	844,579	260,223	7,353	3,928,668
Total:						
	Douglas-fir	2,689,704	446,440	180,163	2,592	3,318,899
	Western hemlock	5,768	--	--	--	5,768
	Ponderosa pine	918,799	92,976	122,346	6,008	1,140,129
	Western white pine	--	4,082	--	--	4,082
	Lodgepole pine	702,384	880,822	75,183	920	1,659,309
	Western larch	368,629	24,192	31,279	156	424,256
	Western redcedar	98,719	--	--	--	98,719
	Whitebark-limber pine	113,096	3,583	2,726	234	119,639
	Grand fir	140,800	1,211	4,965	--	146,976
	Subalpine fir-spruce	389,772	52,826	28,761	3,005	474,364
	Engelmann spruce	212,371	33,303	5,476	--	251,150
	Aspen	34,756	65,333	13,751	259	114,099
	Cottonwood	186,614	8,263	3,503	311	198,691
	Other hardwoods	2,164	--	1,706	153	4,023
	All types	5,863,576	1,613,031	469,859	13,638	7,960,104

Table 34.--Net volume of sawtimber on State and private commercial timberland in Montana by ownership class, forest type, and stand-size class, 1980

Ownership class	Forest type	Stand-size class				
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	All classes
		- - - - Thousand board feet International ¼-inch rule - - - -				
State:						
	Douglas-fir	1,752,884	100,744	84,851	2,078	1,940,557
	Western hemlock	--	--	--	--	--
	Ponderosa pine	439,899	18,153	35,736	2,100	495,888
	Western white pine	--	91	--	--	91
	Lodgepole pine	464,856	166,773	20,603	125	652,357
	Western larch	375,516	14,509	11,899	967	402,891
	Western redcedar	33,392	--	--	--	33,392
	Whitebark-limber pine	48,831	753	158	286	50,028
	Grand fir	128,805	2,302	5,826	--	136,933
	Subalpine fir-spruce	412,972	9,938	17,264	290	440,464
	Engelmann spruce	177,752	5,109	2,231	--	185,092
	Aspen	7,137	6,639	2,499	162	16,437
	Cottonwood	72,386	1,618	849	122	74,975
	Other hardwoods	448	--	6	59	513
	All types	3,914,878	326,629	181,922	6,189	4,429,618
Forest industry:						
	Douglas-fir	4,541,592	211,950	263,578	4,319	5,021,439
	Western hemlock	--	--	--	--	--
	Ponderosa pine	649,716	5,516	68,857	19,019	743,108
	Western white pine	--	--	--	--	--
	Lodgepole pine	922,119	450,895	44,841	836	1,418,691
	Western larch	840,241	7,877	105,317	--	953,435
	Western redcedar	313,918	--	--	--	313,918
	Whitebark-limber pine	163,076	1,072	360	--	164,508
	Grand fir	443,083	--	13,425	--	456,508
	Subalpine fir-spruce	801,747	54,711	45,558	1,264	903,280
	Engelmann spruce	511,865	16,893	1,260	--	530,018
	Aspen	1,614	269	5,464	17	7,364
	Cottonwood	52,619	33	63	--	52,715
	Other hardwoods	--	--	--	--	--
	All types	9,241,590	749,216	548,723	25,455	10,564,984
Farmer and other private:	Douglas-fir	4,803,155	437,030	252,069	5,595	5,497,849
	Western hemlock	21,885	--	--	--	21,885
	Ponderosa pine	2,605,945	136,782	356,249	10,582	3,109,558
	Western white pine	--	9,914	--	--	9,914
	Lodgepole pine	1,108,364	492,171	22,427	1,843	1,624,805
	Western larch	446,187	21,070	4,835	--	472,092
	Western redcedar	77,539	--	--	--	77,539
	Whitebark-limber pine	217,086	4,216	1,703	403	223,408
	Grand fir	32,229	--	730	--	32,959
	Subalpine fir-spruce	442,969	43,127	27,854	13,358	527,308
	Engelmann spruce	276,928	46,402	17,583	--	340,913
	Aspen	120,964	76,693	21,519	1,172	220,348
	Cottonwood	696,800	18,614	7,908	1,094	724,416
	Other hardwoods	6,310	--	1,896	533	8,739
	All types	10,856,361	1,286,019	714,773	34,580	12,891,733
Total:	Douglas-fir	11,097,631	749,724	600,498	11,992	12,459,845
	Western hemlock	21,885	--	--	--	21,885
	Ponderosa pine	3,695,560	160,451	460,842	31,701	4,348,554
	Western white pine	--	10,005	--	--	10,005
	Lodgepole pine	2,495,339	1,109,839	87,871	2,804	3,695,853
	Western larch	1,661,944	43,456	122,051	967	1,828,418
	Western redcedar	424,849	--	--	--	424,849
	Whitebark-limber pine	428,993	6,041	2,221	689	437,944
	Grand fir	604,117	2,302	19,981	--	626,400
	Subalpine fir-spruce	1,657,688	107,776	90,676	14,912	1,871,052
	Engelmann spruce	966,545	68,404	21,074	--	1,056,023
	Aspen	129,715	83,601	29,482	1,351	244,149
	Cottonwood	821,805	20,265	8,820	1,216	852,106
	Other hardwoods	6,758	--	1,902	592	9,252
	All types	24,012,829	2,361,864	1,445,418	66,224	27,886,335

Table 35.--Net volume of timber on State and private commercial timberland in Montana by class of timber, and softwoods and hardwoods, 1980

Class of timber	Softwoods	Hardwoods	All classes
	Thousand cubic feet		
Sawtimber trees:			
Sawlog portion	4,690,340	188,003	4,878,343
Upper-stem portion	631,053	48,826	679,879
Total	5,321,393	236,829	5,558,222
Poletimber trees	2,276,115	125,767	2,401,882
All growing-stock trees	7,597,508	362,596	7,960,104
Sound cull trees	83,249	4,973	88,222
Rotten cull trees	30,487	3,470	33,957
Salvable dead trees	423,715	18,637	442,352
All timber	8,134,959	389,676	8,524,635

Table 36.--Net volume of growing stock on State and private commercial timberland in Montana by forest type and species, 1980

Forest type	Species								
	Douglas-fir	Ponderosa pine	Western white pine	Lodgepole pine	Whitebark-limber pine	Western larch	Grand fir	Subalpine fir	Engelmann spruce
	Thousand cubic feet								
Douglas-fir	2,429,069	279,305	1,829	262,704	19,380	210,968	35,242	17,776	41,606
Western hemlock	329	--	--	691	--	348	409	389	438
Ponderosa pine	89,467	1,018,705	--	12,357	1,576	11,540	554	255	581
Western white pine	--	--	807	1,491	--	--	--	--	--
Lodgepole pine	114,552	14,966	1,768	1,289,265	10,124	116,127	10,514	46,127	30,537
Western larch	76,660	18,012	3,840	44,986	--	236,302	12,689	8,021	11,791
Western redcedar	7,878	927	4,450	1,128	--	17,473	17,388	879	4,270
Whitebark-limber pine	5,332	64	--	3,238	81,936	--	--	16,601	11,607
Grand fir	27,882	1,839	16,055	6,077	--	13,398	59,287	2,832	6,680
Subalpine fir-spruce	39,652	--	5,917	48,680	40,043	36,101	1,014	153,993	145,794
Engelmann spruce	14,626	1,118	1,086	22,888	2,277	31,079	7,391	10,094	143,791
Aspen	7,544	4,777	840	7,448	--	--	--	--	1,935
Cottonwood	339	1,890	--	--	--	1,199	--	201	2,685
Other hardwoods	--	--	--	1,211	--	--	--	--	--
All types	2,813,330	1,341,603	36,592	1,702,164	155,336	674,535	144,488	257,168	401,715

Table 36. (Con.) (con.)

Forest type	Species							All species
	Western hemlock	Western redcedar	Total softwoods	Aspen	Cottonwood	Other hardwoods	Total hardwoods	
	Thousand cubic feet							
Douglas-fir	1,283	1,446	3,300,608	10,700	4,936	2,655	18,291	3,318,899
Western hemlock	3,164	--	5,768	--	--	--	--	5,768
Ponderosa pine	--	--	1,135,035	3,126	1,968	--	5,094	1,140,129
Western white pine	--	--	2,298	--	--	1,784	1,784	4,082
Lodgepole pine	321	2,366	1,636,667	18,175	3,814	653	22,642	1,659,309
Western larch	1,987	2,743	417,031	--	1,426	5,799	7,225	424,256
Western redcedar	8,566	33,909	96,868	495	1,224	132	1,851	98,719
Whitebark-limber pine	861	--	119,639	--	--	--	--	119,639
Grand fir	4,695	4,587	143,332	--	1,746	1,898	3,644	146,976
Subalpine fir-spruce	--	1,644	472,838	393	1,133	--	1,526	474,364
Engelmann spruce	--	2,525	236,875	2,593	7,705	3,977	14,275	251,150
Aspen	--	--	22,544	86,806	4,749	--	91,555	114,099
Cottonwood	--	480	6,794	2,008	186,979	2,910	191,897	198,691
Other hardwoods	--	--	1,211	259	253	2,300	2,812	4,023
All types	20,877	49,700	7,597,508	124,555	215,933	22,108	362,596	7,960,104

Table 37.--Net volume of sawtimber on State and private commercial timberland in Montana by forest type and species, 1980

Forest type	Species								
	Douglas-fir	Ponderosa pine	Western white pine	Lodgepole pine	White-bark limber pine	Western larch	Grand fir	Subalpine fir	Engelmann spruce
	Thousand board feet, International ¼-inch rule								
Douglas-fir	8,946,813	1,380,292	9,028	699,730	50,781	1,018,010	122,264	42,251	150,469
Western hemlock	1,576	--	--	1,021	--	2,068	2,111	2,067	2,390
Ponderosa pine	297,036	3,929,640	--	41,923	3,148	57,635	2,930	--	2,087
Western white pine	--	--	4,442	5,563	--	--	--	--	--
Lodgepole pine	393,249	79,767	2,816	2,387,363	36,925	520,867	27,090	82,711	120,532
Western larch	294,598	106,614	20,040	128,430	--	1,158,449	38,490	17,348	41,331
Western redcedar	35,767	4,943	25,028	--	--	85,132	78,643	4,063	21,265
Whitebark-limber pine	23,053	333	--	8,344	319,956	--	--	33,481	50,951
Grand fir	128,181	11,345	75,346	15,038	--	76,709	234,427	5,614	28,990
Subalpine fir-spruce	183,560	--	32,622	173,617	169,687	197,532	2,908	386,834	709,115
Engelmann spruce	70,845	6,656	6,148	71,302	4,264	174,270	32,664	27,803	605,413
Aspen	36,201	26,648	1,486	25,381	--	--	--	--	7,507
Cottonwood	982	10,923	--	--	--	6,667	--	--	12,806
Other hardwoods	--	--	--	1,902	--	--	--	--	--
All types	10,411,861	5,557,161	176,956	3,559,614	584,761	3,297,339	541,527	602,172	1,752,856

(con.)

Table 37. (Con.)

Forest type	Species							All species
	Western hemlock	Western redcedar	Total softwoods	Aspen	Cottonwood	Other hardwoods	Total hardwoods	
	Thousand board feet, International ¼-inch rule							
Douglas-fir	4,841	4,086	12,428,565	9,211	20,338	1,731	31,280	12,459,845
Western hemlock	10,652	--	21,885	--	--	--	--	21,885
Ponderosa pine	--	--	4,334,399	5,766	8,389	--	14,155	4,348,554
Western white pine	--	--	10,005	--	--	--	--	10,005
Lodgepole pine	--	5,506	3,656,826	28,345	10,682	--	39,027	3,695,853
Western larch	4,984	10,156	1,820,440	--	7,122	856	7,978	1,828,418
Western redcedar	19,015	142,042	415,898	2,622	5,640	689	8,951	424,849
Whitebark-limber pine	1,826	--	437,944	--	--	--	--	437,944
Grand fir	22,934	17,092	615,676	--	6,319	4,405	10,724	626,400
Subalpine fir-spruce	--	7,917	1,863,792	1,934	5,326	--	7,260	1,871,052
Engelmann spruce	--	10,918	1,010,283	12,886	30,774	2,080	45,740	1,056,023
Aspen	--	--	97,223	125,148	21,778	--	146,926	244,149
Cottonwood	--	1,850	33,228	3,914	807,420	7,544	818,878	852,106
Other hardwoods	--	--	1,902	--	1,052	6,298	7,350	9,252
All types	64,252	199,567	26,748,066	189,826	924,840	23,603	1,138,269	27,886,335

Table 38.--Net volume of growing stock and sawtimber on State and private commercial timberland in Montana by ownership class and species, 1980

Species	Ownership			Total
	State	Forest industry	Farmer and other private	
		GROWING STOCK		
		Thousand cubic feet		
Douglas-fir	401,911	1,003,705	1,407,714	2,813,330
Ponderosa pine	152,504	287,367	901,732	1,341,603
Western white pine	9,673	22,137	4,782	36,592
Lodgepole pine	273,291	641,421	787,452	1,702,164
Whitebark-limber pine	24,799	43,350	87,187	155,336
Western larch	138,204	394,773	141,558	674,535
Grand fir	23,800	101,006	19,682	144,488
Subalpine fir	60,267	101,492	95,409	257,168
Engelmann sprcue	67,952	176,102	157,661	401,715
Western hemlock	459	13,346	7,072	20,877
Western redcedar	7,683	28,409	13,608	49,700
Total softwoods	1,160,543	2,813,108	3,623,857	7,597,508
Aspen	9,610	8,406	106,539	124,555
Cottonwood	20,434	10,528	184,971	215,933
Other hardwoods	5,764	3,043	13,301	22,108
Total hardwoods	35,808	21,977	304,811	362,596
All species	1,196,351	2,835,085	3,928,668	7,960,104
		SAWTIMBER		
		Thousand board feet, International ¼-inch rule		
Douglas-fir	1,576,033	3,924,044	4,911,784	10,411,861
Ponderosa pine	657,311	1,532,091	3,367,759	5,557,161
Western white pine	49,033	110,092	17,831	176,956
Lodgepole pine	619,148	1,098,331	1,842,135	3,559,614
Whitebark-limber pine	103,872	186,583	294,306	584,761
Western larch	739,204	2,024,756	533,379	3,297,339
Grand fir	88,391	387,222	65,914	541,527
Subalpine fir	155,328	248,715	198,129	602,172
Engelmann spruce	299,397	831,743	621,716	1,752,856
Western hemlock	1,030	41,169	22,053	64,252
Western redcedar	31,932	118,995	48,640	199,567
Total softwoods	4,320,679	10,503,741	11,923,646	26,748,066
Aspen	13,952	12,501	163,373	189,826
Cottonwood	86,182	42,397	796,261	924,840
Other hardwoods	8,805	6,345	8,453	23,603
Total hardwoods	108,939	61,243	968,087	1,138,269
All species	4,429,618	10,564,984	12,891,733	27,886,335

Table 39.--Net annual growth of growing stock and sawtimber on State and private commercial timberland in Montana by ownership class and species, 1979

Species	Ownership			Total
	State	Forest industry	Farmer and other private	
	GROWING STOCK			
	Thousand cubic feet			
Douglas-fir	8,002	17,890	31,530	57,422
Ponderosa pine	3,113	4,209	20,445	27,767
Western white pine	154	526	368	1,048
Lodgepole pine	7,046	14,668	18,887	40,601
Whitebark-limber pine	171	458	1,284	1,913
Western larch	2,390	4,886	3,583	10,859
Grand fir	562	2,079	323	2,964
Subalpine fir	1,064	3,226	2,975	7,265
Engelmann spruce	1,057	2,124	3,696	6,877
Western hemlock	56	586	423	1,065
Western redcedar	165	657	346	1,168
Total softwoods	23,780	51,309	83,860	158,949
Aspen	238	223	2,520	2,981
Cottonwoods	396	188	3,263	3,847
Other hardwoods	370	84	554	1,008
Total hardwoods	1,004	495	6,337	7,836
All species	24,784	51,804	90,197	166,785
	Sawtimber			
	Thousand board feet, International ¼-inch rule			
Douglas-fir	34,554	79,735	140,861	255,150
Ponderosa pine	15,676	25,315	95,301	136,292
Western white pine	697	2,728	654	4,079
Lodgepole pine	14,367	31,777	49,838	95,982
Whitebark-limber pine	627	1,537	5,158	7,322
Western larch	8,881	14,671	16,441	39,993
Grand fir	2,104	7,963	2,387	12,454
Subalpine fir	3,394	4,013	4,284	11,691
Engelmann spruce	4,190	10,825	13,434	28,449
Western hemlock	41	967	2,515	3,523
Western redcedar	708	1,360	2,990	5,058
Total softwoods	85,239	180,891	333,863	599,993
Aspen	688	335	9,210	10,233
Cottonwood	1,627	379	16,796	18,802
Other hardwoods	805	100	221	1,126
Total hardwoods	3,120	814	26,227	30,161
All species	88,359	181,705	360,090	630,154

Table 40.--Annual mortality of growing stock and sawtimber on State and private commercial timberland in Montana by ownership class and species, 1979

Species	Ownership			Total
	State	Forest industry	Farmer and other private	
	GROWING STOCK			
	Thousand cubic feet			
Douglas-fir	1,399	4,869	3,935	10,203
Ponderosa pine	636	754	2,715	4,105
Western white pine	30	158	136	324
Lodgepole pine	1,623	5,118	4,731	11,472
Whitebark-limber pine	164	--	153	317
Western larch	182	1,652	379	2,213
Grand fir	174	1,275	428	1,877
Subalpine fir	643	1,286	830	2,759
Engelmann spruce	377	1,442	974	2,793
Western hemlock	--	--	--	--
Western redcedar	9	69	94	172
Total softwoods	5,237	16,623	14,375	36,235
Aspen	74	2	780	856
Cottonwoods	106	33	1,088	1,227
Other hardwoods	--	--	--	--
Total hardwoods	180	35	1,868	2,083
All species	5,417	16,658	16,243	38,318
	SAWTIMBER			
	Thousand board feet, International ¼-inch rule			
Douglas-fir	4,557	16,670	10,040	31,267
Ponderosa pine	2,312	3,864	8,209	14,385
Western white pine	166	659	416	1,241
Lodgepole pine	3,691	8,458	13,514	25,663
Whitebark-limber pine	675	--	292	967
Western larch	706	9,655	480	10,841
Grand fir	733	5,952	1,552	8,237
Subalpine fir	1,873	3,697	1,841	7,411
Engelmann spruce	1,698	4,912	5,151	11,761
Western hemlock	--	--	--	--
Western redcedar	43	348	464	855
Total softwoods	16,454	54,215	41,959	112,628
Aspen	134	--	1,130	1,264
Cottonwood	405	162	4,219	4,786
Other hardwoods	--	--	--	--
Total hardwoods	539	162	5,349	6,050
All species	16,993	54,377	47,308	118,678

APPENDIX V: TREE SPECIES NATIVE TO MONTANA

Coniferous	
Grand fir	*Abies grandis*
Subalpine fir	*A. lasiocarpa*
Utah juniper	*Juniperous osteosperma*
Rocky Mountain juniper	*J. scopulorum*
Subalpine larch	*Larix lyallii*
Western larch	*L. occidentalis*
Engelmann spruce	*Picea engelmannii*
White spruce	*P. glauca*
Whitebark pine	*Pinus albicaulis*
Lodgepole pine	*P. contorta* var. *latifolia*
Limber pine	*P. flexilis*
Western white pine	*P. monticola*
Ponderosa pine	*P. ponderosa*
	P. ponderosa var. *scopulorum*
Douglas-fir	*Pseudotsuga menziesii* var. *glauc*
Western redcedar	*Thuja plicata*
Western hemlock	*Tsuga heterophylla*
Mountain hemlock	*T. mertensiana*
Deciduous	
Boxelder	*Acer negundo*
Paper birch	*Betula papyrifera*
Green ash	*Fraxinus pennsylvanica*
Balsam poplar	*Populus balsamifera*
Eastern cottonwood	*P. deltoides*
Black cottonwood	*P. trichocarpa*
Quaking aspen	*P. tremuloides*
Cascara buckthorn	*Rhamnus purshiana*
Peachleaf willow	*Salix amygdaloides*
American elm	*Ulmus americana*

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Presents highlights of the forest resources of Montana as of 1980. Describes the forest resources, their extent, condition, and location, and discusses levels of some nontimber use of forest lands. Includes statistical tables: area by land classes, ownership, growing stock and sawtimber volumes, growth, mortality, roundwood products output, utilization, and residues.

KEYWORDS: commercial timberland, forest inventory, timber volume, timber mortality, timber removals

The Intermountain Research Station, headquartered in Ogden, Utah, is one of eight Forest Service Research stations charged with providing scientific knowledge to help resource managers meet human needs and protect forest and range ecosystems.

The Intermountain Station's primary area includes Montana, Idaho, Utah, Nevada, and western Wyoming. About 231 million acres, or 85 percent, of the land area in the Station territory are classified as forest and rangeland. These lands include grasslands, deserts, shrublands, alpine areas, and well-stocked forests. They supply fiber for forest industries; minerals for energy and industrial development; and water for domestic and industrial consumption. They also provide recreation opportunities for millions of visitors each year.

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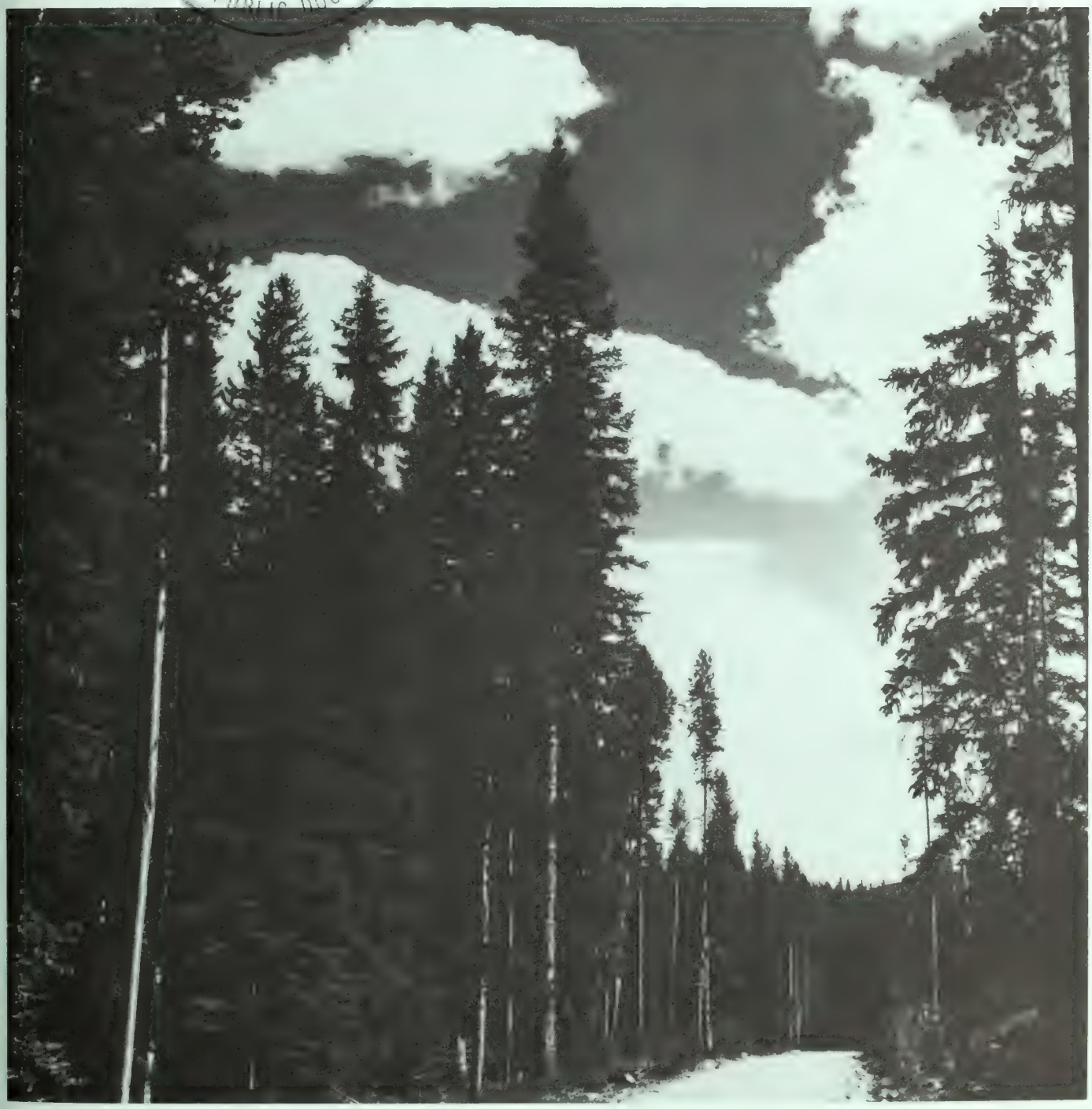
Idaho's Forest Resources

**Robert E. Benson
Alan W. Green
Dwane D. Van Hooser**



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REFACE

Forest Survey is a continuing nationwide undertaking nducted by the Forest Service, U.S. Department of griculture, with the primary objective of providing an sessment of the renewable resources on the Nation's rest and range lands. This requires periodic State-by-ate resource inventories. Originally, Forest Survey was thorized by the McSweeney-McNary Act of 1928. The rrent authorization is through the Renewable Resources esearch Act of 1978.

The Intermountain Research Station with headquarters Ogden, UT, administers the forest resource inventories r the Rocky Mountain States of Arizona, Colorado, Idaho, ontana, New Mexico, Nevada, Utah, Wyoming, western outh Dakota, western Texas, and Oklahoma's Panhandle. hese inventories provide information on the extent and ondition of State and privately owned forest lands, olume of timber, and rates of timber growth and mortality. hese data, when combined with similar information for ederal lands, provide a basis for forest policies and pro-rams and for the orderly development and use of the sources.

ACKNOWLEDGMENTS

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RESEARCH SUMMARY

Presents highlights of the forest resources of Idaho as of 1981. Describes the forest resources, their extent, condition, and location, and discusses levels of some nontimber use of forest lands. Includes statistical tables: area by land classes, ownership, growing-stock and sawtimber volumes, growth, mortality, roundwood products output, utilization, and residues.

HIGHLIGHTS

Area

- Total land area in Idaho is 52,891 thousand acres.
- Forests cover slightly more than 21.9 million acres, of which about 819 thousand acres is woodland.
- Timberlands make up roughly 96 percent of the forest land.
- 3.2 million acres of the timberland (about 15 percent) is privately owned.
- 12.8 million acres (87 percent) of the publicly owned timberland is on National Forests.
- About 37 percent of private timberlands is owned by forest industries.
- Douglas-fir is the single most extensive forest type (over 7 million acres).
- Lodgepole pine covers nearly 4 million acres.
- About 2.5 million acres (15 percent) of the forest land is reserved from timber harvest.
- Sawtimber stands make up over two-thirds of Idaho's timberlands.
- Woodland in southwestern Idaho is concentrated in Owyhee County and is western juniper. Woodland in southeastern Idaho is a mix of Utah and Rocky Mountain juniper.

July 1987
Intermountain Research Station
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Volume

- Idaho's timberlands contain an estimated 30 billion cubic feet of wood in growing-stock trees.
- 70 percent of the volume is on National Forests.
- 25 percent of the volume is Douglas-fir.
- 72 percent of the volume is at middle and lower elevations.
- About half the softwood sawtimber volume is in trees less than 19 inches diameter at breast height (d.b.h.).

Components of Change

- Annual mortality of 115 million cubic feet in 1981 was about 15 percent of gross growth.
- Net annual growth of growing stock was about 648 million cubic feet.
- Sawtimber removals from private lands exceeded net growth by 448 million board feet.

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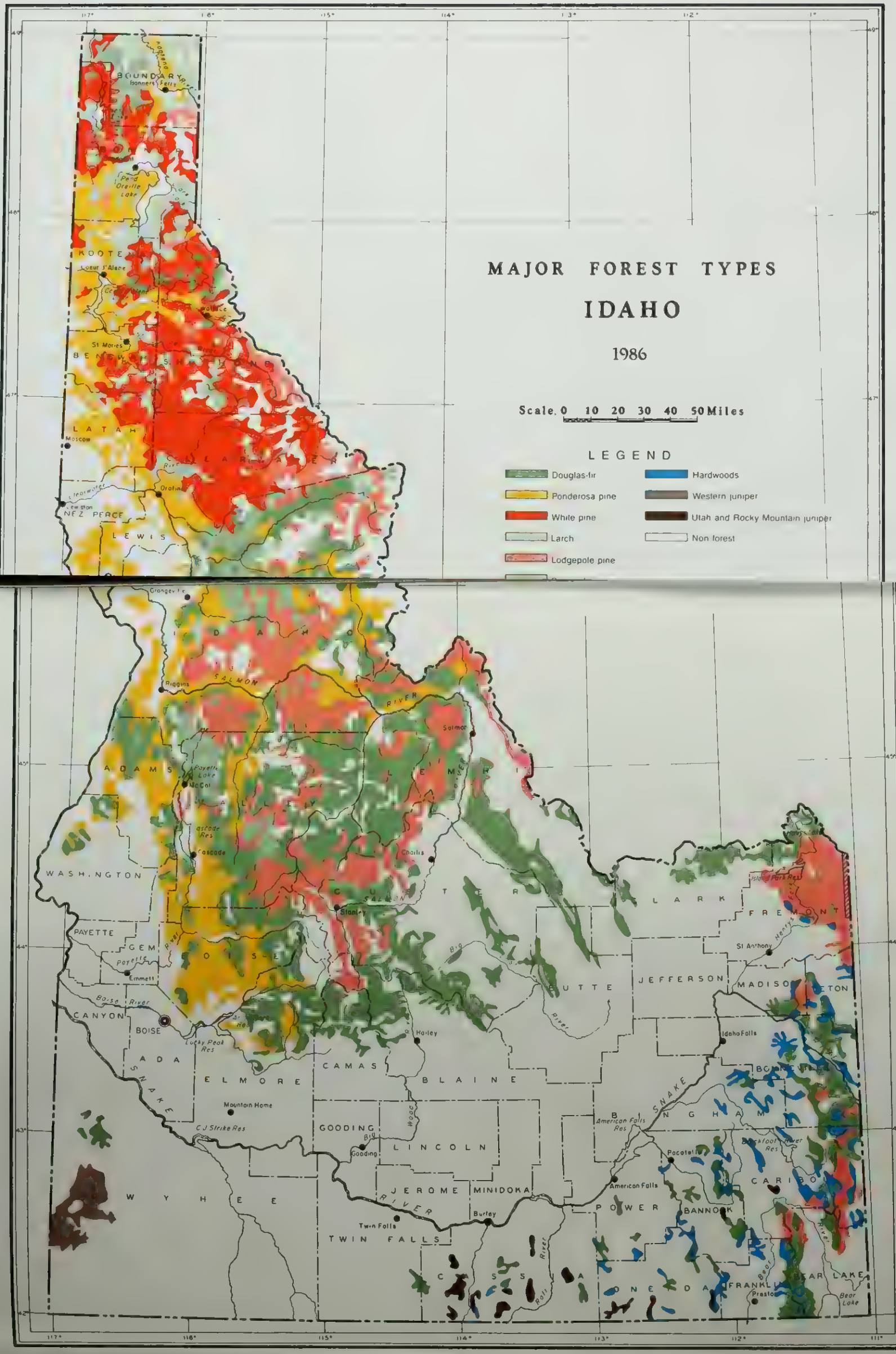

Figure 1—Forest types in Idaho.

Idaho's Forest Resources

Robert E. Benson
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INTRODUCTION

This resource bulletin presents the principal findings of the latest inventory of Idaho's forest resources. This is the most recent in a series of reports and combines data on National Forests provided by the Intermountain and Northern Regions, and data on private and miscellaneous forest lands obtained by the Intermountain Research Station from field surveys conducted from 1980 to 1981, and data from State lands collected up to 1981 by the Department of State Lands. U.S. Department of the Interior, Bureau of Land Management (BLM) data were collected by the Bureau in 1974.

The data in this report represent changes from previously reported forest resource information for the State. Basically, there are three sources of changes: changes in forest land area estimates due to sampling design and intensity; changes in land classifications and uses; and biological and physical changes in the forest, primarily growth, mortality, and removals (particularly through harvesting).

Because of definition changes, direct comparisons with previous surveys cannot be made, but relative trends in the important concerns such as growth, harvest, and mortality can be observed. These biological changes and current land use designations have an important role in the outlook for the timber industry and other uses of the forest resources in the future.

Idaho contains 53.481 million acres of which nearly 52.9 million acres is land and nearly 0.6 million acres is water (table 1).

Table 1.--Total land and water area in Idaho by ownership class, 1981

Ownership class	Area
	- - - Thousand acres - - -
Land:	
National Forest	20,422.8
National Parks[1]	87.1
Other public:	
Bureau of Land Management	12,620.9
Miscellaneous Federal	166.5
State	2,649.1
County and municipal	120.6
Total other public	15,557.1
Private:	
Forest industry[2]	1,271.9
Nonindustrial private:	
Farmer-rancher	12,605.3
Other	2,946.8
Total nonindustrial private	15,552.1
Total private	16,824.0
Total land area	52,891.0
Census water	590.2
Total land and water[3]	53,481.2

[1]Not included with miscellaneous Federal, a component of other public, for purpose of clarity.
[2]Forest industry is a component of private ownership, but because of its importance to the Idaho timber supply situation, area and resource statistics are shown separately in this and other tables dealing with owner groups in this report.
[3]U.S. Bureau of the Census, land and water area of the United States, 1980.

The forests of Idaho are some of the most diverse in North America, if not the world. They range from the lush green cedar and hemlock stands of the panhandle in northern Idaho to the slow-growing trees of the pinyon-juniper type that are scattered throughout the southern portion of the State.

More than 40 percent of Idaho's land is forest.

A recent forest survey of Idaho revealed there are nearly 22 million acres of forest land in the State (table 2), more than 40 percent of the total land area in Idaho. The preponderance (roughly 96 percent) of these acres are classified as timberland, generally capable of producing timber products, and include forest types made up of species such as pines, firs, and spruce. A small portion (0.8 million acres or 3.7 percent) is classed as woodland, which includes pinyon, juniper, and miscellaneous hardwood forest types (table 2).

Table 2.--Total land area in Idaho by land class and ownership class, 1981

Land class	National Forest	Other public	Forest industry	Nonindustrial private	Total
	- - - - - - - - - - - Thousand acres - - - - - - - - - - -				
Timberland:					
Deferred	935.3	--	--	--	935.3
Reserved	2,491.5	34.5	--	--	2,526.0
Nonreserved	12,807.5	1,635.0	1,178.1	2,040.0	17,660.6
Woodland:					
Reserved	1.0	--	--	--	1.0
Nonreserved	--	559.8	10.2	248.4	818.4
Total forest land:					
Deferred	935.3	--	--	--	935.3
Reserved	2,492.5	34.5	--	--	2,527.0
Nonreserved	12,807.5	2,194.8	1,188.3	2,288.4	18,479.0
Total	16,235.3	2,229.3	1,188.3	2,288.4	21,941.3
Nonforest land	4,187.5	13,414.9	83.6	13,263.7	30,949.7
Total land area	20,422.8	15,644.2	1,271.9	15,552.1	52,891.0

Idaho has long been an important supplier of wood products, and the popular trade name "Idaho White Pine" given to western white pine (*Pinus monticola*) indicates a unique and important role in the history of the development of the timber industry of the State.

Idaho's forest lands also provide a wide variety of other resources and uses. Most of the water in the State originates in the high, forested mountain areas, and the forest cover provides valuable soil-holding properties in these watersheds. Forage and cover for both domestic livestock and wildlife are important components of the forest and have contributed to Idaho's role as an important producer of red meat and wool and to the State's reputation for excellent big game hunting and outstanding recreational fishing.

The most productive timberland is north of the Salmon River.

The part of the State north of the Salmon River contains some of the most productive forest land and is virtually a continuous green carpet of trees. Between the Salmon River and the Snake River plains, extensive forest land is interspersed with rugged mountain ranges and broad rangeland valleys. The southeastern portion of the State contains a sizable high-elevation lodgepole pine and Douglas-fir forest that abuts Yellowstone National Park, and a considerable area of aspen and Douglas-fir adjacent to the Utah and Wyoming borders (fig. 1).

FOREST LAND CLASSES

About 2.5 million acres are reserved from timber cutting.

About 2.5 million acres of Idaho's forest lands are reserved—withdrawn from timber use through statute such as designated wilderness areas, or administrative designation such as special use areas, or facilities such as houses, powerline rights-of-way,[1] etc. (table 2). Another 0.9 million acres is deferred for possible addition to the wilderness. The land not reserved and generally capable of timber production is about 17.7 million acres (table 2). However, even on those lands not reserved some areas may have cutting restrictions because of other resource constraints, so that some of the timber may never be available for harvesting.

Woodland Types and Ownership

About 7.2 million acres are not suited for timber production.

The woodland classification newly adopted for the survey better reflects the capability of the land to produce forest-related resources other than the usual industrial roundwood products. In addition, the timberland base has been redefined to include some lands not formerly meeting the criteria for "commercial forest land"—that is, being able to produce 20 cubic feet of wood per acre per year. Previous classification showed about 7.2 million acres of "noncommercial" forest land, 5.3 million of which was considered unproductive (Green and Van Hooser 1983). This land has been reclassified into the 819 thousand acres of woodland, and into nonreserved timberland. The 17.7 million acres of unreserved timberland is considered suited for commercial timber purposes and roughly corresponds to the 13.5 million acres previously classed as commercial, nonreserved forest land. The important change, however, as mentioned earlier, is the inclusion of land that formerly would not meet the criteria of "commercial timberland" because of productivity.

Some 84 percent of the forest land belongs to the public . . .

National Forests oversee most of it.

As shown in the map contained in the pocket, inside back cover, about 84 percent of the forest land is publicly owned, and National Forests are the principal administrative agency. Over 70 percent of the timberland that is not reserved is on National Forests. Other public agencies (other Federal, State, and local government agencies) administer about 10 percent of the timberlands.

Forest industries and nonindustrial private owners have about 7 percent and 12 percent, respectively (fig. 2). The large number of private owners (about 37,600) makes it difficult to communicate forestry information of concern to them. Detailed data on State and privately owned forest lands have been published in an earlier report (Van Hooser and Green 1985).

About 19 percent of the timberland is held by 37,600 private owners.

All of the deferred timberland and most of the reserved timberland is on National Forests. Other public agencies, primarily BLM, account for 68 percent of the nonreserved woodland, and nonindustrial owners most of the rest of the woodlands.

[1]Many powerline lanes can be used for production of small products such as posts, corral poles, and Christmas trees.

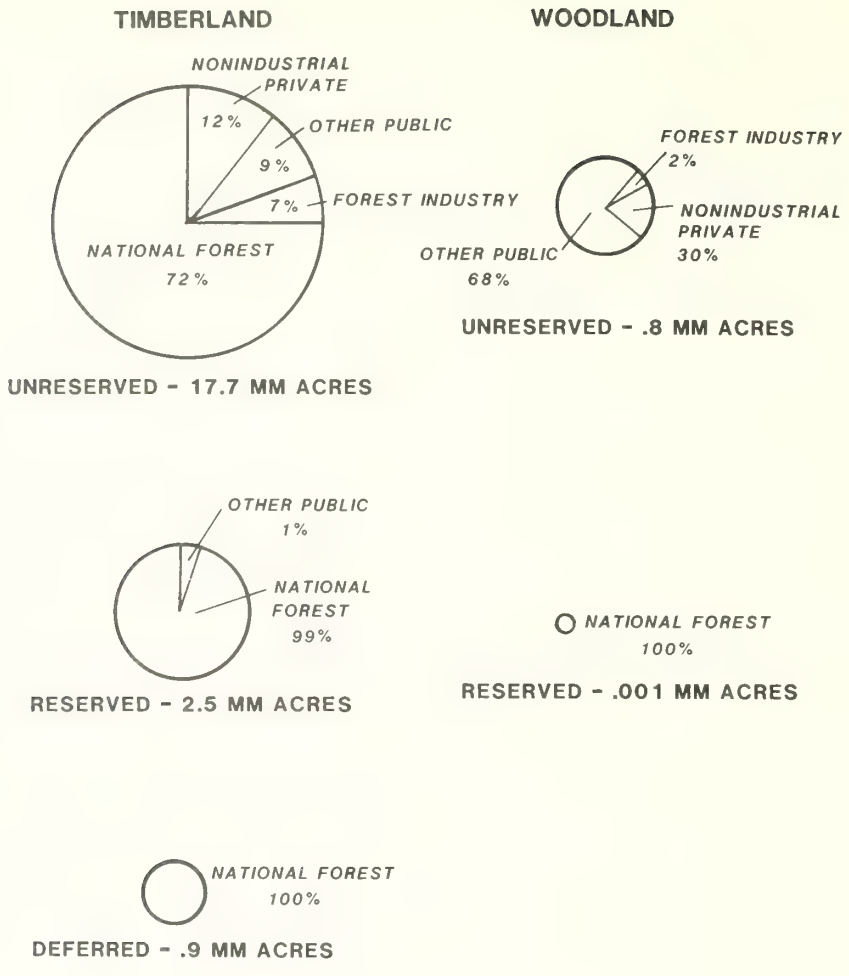


Figure 2—Area of timberland and woodland in Idaho by land class and ownership, 1981.

Pinyons, junipers, and their associates are the major woodland species.

Juniper and associates are by far the major woodland species. Rocky Mountain (*Juniperus scopulorum*) and Utah (*J. osteosperma*) junipers extend over 369 thousand acres. Western juniper (*J. occidentalis*) and pinyon/juniper mix account for another quarter million acres (fig. 3). The bulk of these woodland types is in public ownership. Mountain brush woodland and other hardwood types total about 138 thousand acres and are about evenly divided between public and private ownerships. These types occur on somewhat more moist areas and have more potential for grazing than do the dry juniper types. The most moist woodlands are in the riparian zone along streams and spring areas. These are vital to farm, ranch, and grazing operations and, as might be expected, are primarily in private ownership.

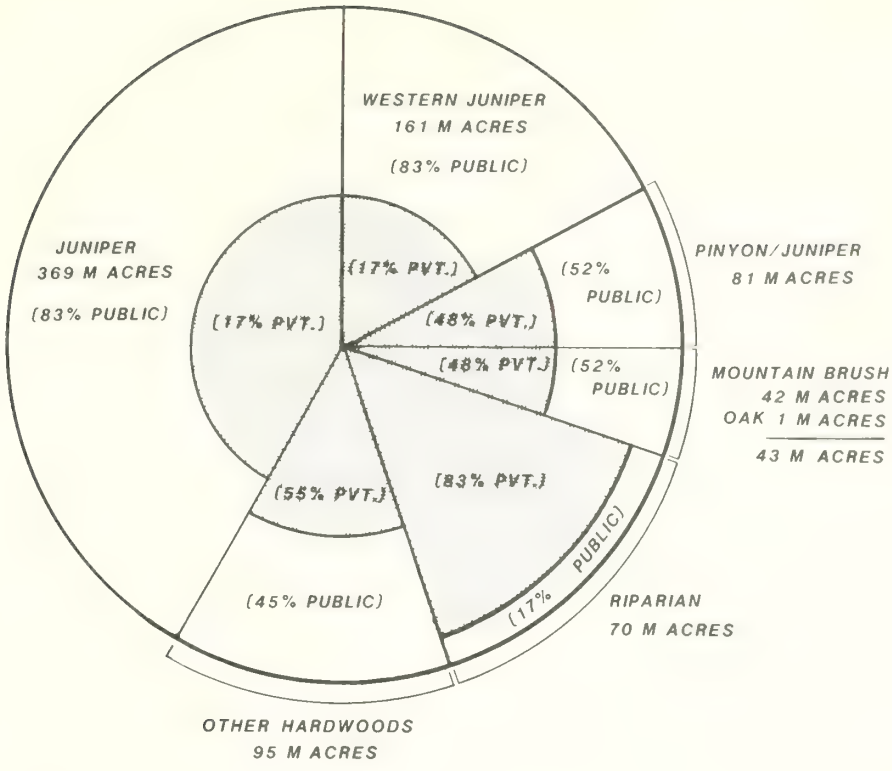


Figure 3—Area of woodland in Idaho by forest type and owner, 1981.

Timberland Types and Ownership

Five major softwood forest types make up 87 percent of the timberland.

The timberlands of Idaho have been classified by forest type based on the plurality of stocking—that is, the tree species that has the largest percentage of the basal area in the stand. This provides a good indication of the kinds of wood products growing on the area and also gives an indication of the type of forest management involved in harvesting. There are, however, a mix of tree species in most forest types, and habitat conditions also vary widely. So a given forest type may contain a variety of both timber and nontimber resources.

Douglas-fir—Douglas-fir (*Pseudotsuga menziesii*) is the single most extensive forest type, with over 7 million acres total, of which 5.8 million acres are nonreserved. This type is found throughout the whole State. In the north, with its generally lower elevations, Douglas-fir is usually found on south-facing and west-facing slopes. In the southern and eastern portions of the State it is usually the lowest elevation timber type, extending through the middle elevations. Commonly it is mixed with ponderosa pine (*Pinus ponderosa*) in the southwest (north of the Snake River) and with aspen (*Populus tremuloides*) in the eastern portions. About three-fourths of this type is on National Forest land; nonindustrial private owners account for about 13 percent.

Ownership class	Land class		
	Nonreserved	Deferred	Reserved
	Thousand acres		
National Forest	4,357.4	373.9	847.1
Other public	525.0		0.7
Forest industry	250.5		—
Nonindustrial private	712.8		—
Total	5,845.7	1,221.7	

Lodgepole Pine—Lodgepole pine (*Pinus contorta*) is the next most extensive type, covering nearly 4 million acres, and occupies two rather different niches in Idaho's forests. In the north it occurs primarily mixed among other forest types and indicates a past fire disturbance. Here it is a seral type—that is, lodgepole stands will usually be replaced by other species rather rapidly in the natural course of plant succession. In the great burn areas of northern Idaho, stands of lodgepole created by fire are so extensive and frequently so dense that the other successional species are slower in reclaiming the forest. In southern and southeastern Idaho, lodgepole grows in pure, extensive stands at high elevations. Here it is frequently near climax—that is, stands of lodgepole will generally succeed themselves, and only occasionally will alpine fir (*Abies lasiocarpa*) or Engelmann spruce (*Picea engelmannii*) be successful in replacing the lodgepole. Nearly a quarter of the lodgepole type is reserved or deferred.

Ownership class	Land class		
	Nonreserved	Deferred	Reserved
	Thousand acres		
National Forest	2,644.2	203.7	685.0
Other public	128.6		33.3
Forest industry	56.3		—
Nonindustrial private	191.0		—
Total	3,020.1	922.0	

Engelmann Spruce-Fir—The Engelmann spruce-fir type occupies over 3 million acres, about 15 percent of the State's timberland. It is the "picture postcard" type found at high elevations below the snowcapped peaks and surrounding mountain lakes, with the dark massive crowns of spruce and the needle-pointed crowns of its close associate, subalpine fir, and is almost synonymous with high-mountain recreation. These stands could also be called Idaho's lifeblood land because much of the State's precipitation falls in these high elevations, particularly the deep snowpack that feeds the irrigation ditches during the long, dry summers. Not surprisingly, most of this type is on the National Forests, and over 21 percent is reserved or deferred, indicating its general remoteness and history of little disturbance.

Ownership class	Land class		
	Nonreserved	Deferred	Reserved
	Thousand acres		
National Forest	2,247.4	128.5	542.7
Other public	102.4		—
Forest industry	100.4		—
Nonindustrial private	48.6		—
Total	2,498.8	671.2	

Ponderosa Pine—One of the most important commercial species in Idaho's forests, ponderosa pine (*Pinus ponderosa*) is found throughout the State at the lowest elevations of timberland growth, but the largest concentrations of ponderosa are in the southwestern part of the State (north of the Snake River) at low and middle elevations, often in association with Douglas-fir. The large, old-growth trees that develop yellow-red bark in large plates are often called "punkins" or "pickles" by loggers. Long a mainstay of the wood industry, only about 13 percent of the type is reserved or deferred. Growing as it does at lower elevations, the ponderosa pine type often provides grazing for livestock and vital winter forage and browse for big game animals.

Ownership class	Land class		
	Nonreserved	Deferred	Reserved
	Thousand acres		
National Forest	1,156.5	118.0	168.8
Other public	228.4		0.5
Forest industry	103.7		–
Nonindustrial private	417.8		–
Total	1,906.4	287.3	

Grand Fir—The grand fir (*Abies grandis*) type is limited primarily to the area north of the Snake River and contains some of the most productive lands for timber crops. It occupies much of the midelevation range and is found on sites that are predominantly fairly moist but will tolerate some fairly dry and quite moist sites. Pure stands of grand fir are not the rule. Usually, this type has a mix of species—almost any timber species can be found in the grand fir type. Only about 10 percent of the type is reserved or deferred. The forest industry owns about a fifth of the grand fir type. This is the largest single forest type in forest industry ownership.

Ownership class	Land class		
	Nonreserved	Deferred	Reserved
	Thousand acres		
National Forest	922.3	60.6	116.3
Other public	218.1		–
Forest industry	364.6		–
Nonindustrial private	262.1		–
Total	1,767.1	176.9	

But four other conifers are economically significant.

Other Conifers—The five forest types discussed above make up nearly 87 percent of the State's forest land. Although the other conifer types individually occupy less than 1 million acres each, several are extremely important in the timber economy. Idaho (western) white pine has long been a prized species, used for various specialty products that require easily worked wood. Western redcedar (*Thuja plicata*) provides a number of unique durable products such as sawn siding and split products such as shakes and posts. Larch (*Larix occidentalis*) and hemlock (*Tsuga heterophylla*) are staples in the dimension lumber market. Often these four species, along with grand fir, are found growing together, particularly on moist sites, so the type classifications should be interpreted as indicating a generous mix of species in any of these types. Forest industry owns over a third of the western redcedar type, but the other types are predominantly on National Forest land.

Aspen and cottonwood are the only hardwood types.

Hardwoods—The aspen and cottonwood types are the only hardwood timber types. A rather disproportionate amount of these types is in private ownership: 41 percent compared to only 18 percent of all timberlands in private lands. Commonly, aspen and cottonwood (*Populus* L.) are at lower elevations and provide significant grazing and browsing for both livestock and wildlife.

Most of the less extensive types (the four conifer types discussed above and the hardwood types) are nonreserved timberlands. Detailed data on status and ownership are given in the appendix.

THE TIMBER RESOURCE

The timber resource—the amounts, kinds, and availability for commercial use—continues to be a prime focal point of interest in Idaho's forest lands. While other resources of the forest have experienced rapid growth in demands placed on them and received increasing management attention, timber harvesting remains at the center of concern for forest land managers. Timber harvesting and processing are the foundation

of economic activity in northern Idaho and several localized areas elsewhere. Furthermore, access to the forest for effective management for most other resources is through roading and other activities tied to level of harvest.

This section focuses on those characteristics of the forest of particular concern to growing and harvesting timber crops.

Stand-Size Classes

The timber resource is predominantly sawtimber stands...

Sawtimber stands occupy over two-thirds of Idaho's timberlands. Poletimber accounts for about 15 percent of the area, seedling-sapling stands about 12 percent, and nonstocked areas just over 5 percent. These proportions are about the same on all ownerships, although forest industry has a slightly higher percentage of sawtimber and lower percentage of poletimber. Other public lands have 15 percent nonstocked lands, three times the average for all owners (fig. 4). About 3.6 million acres of National Forest land previously excluded from the commercial forest land class (because of low productivity) have not been analyzed as to stand size and so are not included in the data (table 10 in appendix).

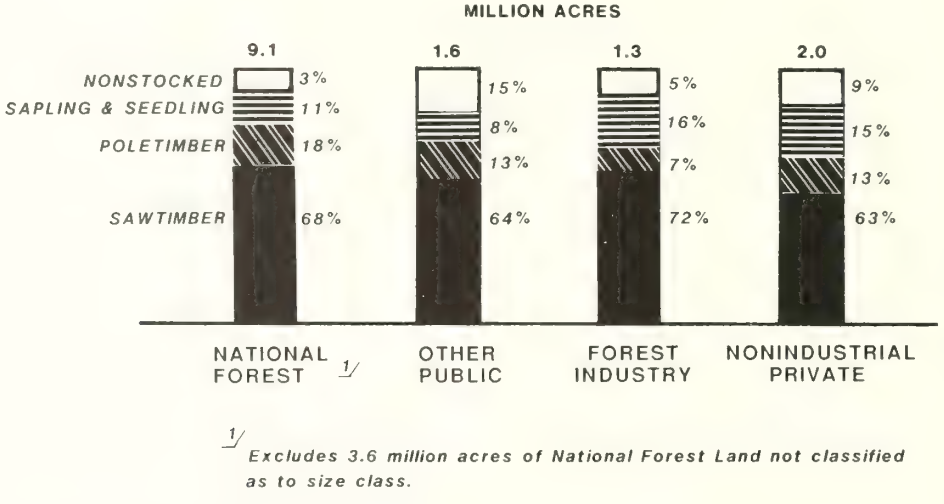


Figure 4—Area of timberland in Idaho by stand size class and owner group, 1981.

and 77 percent of the volume is in sawtimber trees.

Sawtimber size trees (9 inches d.b.h. and larger for softwoods, 11 inches and larger for hardwoods) account for over three-fourths of the total cubic volume of wood on Idaho timberlands. Of the total volume, 77 percent is sawlog material (see sawlog definition), 7 percent is the upper stem portion of sawlog trees, 15 percent is in poletimber size trees, and the remaining volume is in cull or salvable dead trees (fig. 5).

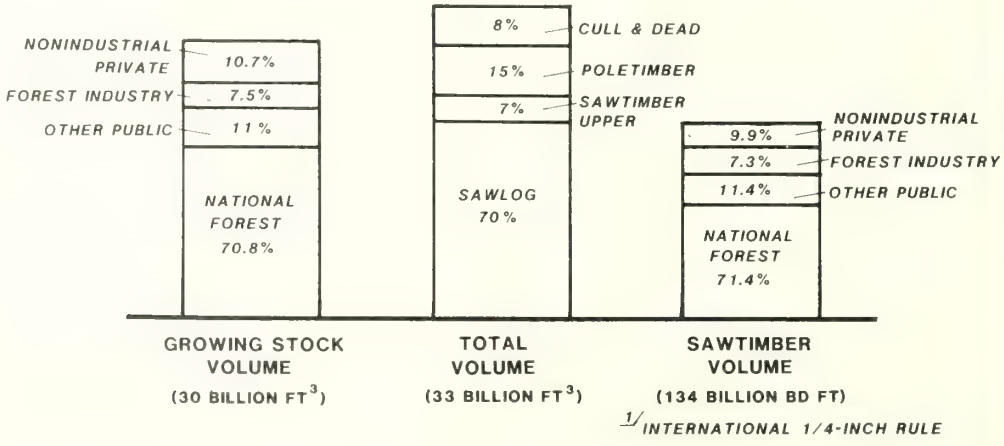


Figure 5—Net volume of growing stock and sawtimber on timberland in Idaho by owner group and class of timber, 1981.

Volume by Owner

Total volume is 30 billion cubic feet... and 70 percent is on National Forests.

Of the 30 billion cubic feet of wood that qualify as growing stock (see definitions), just under 71 percent is National Forest timber and just over 7 percent forest industry. Other public and nonindustrial private owners each have about 11 percent of the growing-stock volume. Looking just at sawlog volume, the ownership is distributed about the same as all growing stock, with slightly more in National Forests and slightly less in nonindustrial private, on a percentage basis (fig. 5).

Volume by Species

Over 25 percent of the volume is Douglas-fir.

Douglas-fir accounts for over a fourth of the growing-stock volume on Idaho timberlands (table 18 in appendix). Grand fir (including a small volume of white fir) accounts for just over 14 percent, lodgepole pine for about 13 percent, and ponderosa pine 9.6 percent. All other species account for less than 7 percent individually. The species groupings in table 3 give a rough idea as to both values and accessibility.

Table 3.--Net growing-stock volume and percent of volume on timberland by species

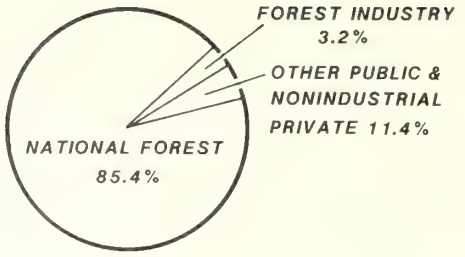
		Volume, million cubic feet	Percent of volume
Higher elevation species			
Lodgepole pine		4,079.3	13.3
Whitebark pine and limber pine		153.4	.5
Engelmann spruce		2,066.9	6.8
Subalpine fir		2,012.0	6.6
	TOTAL	8,311.6	27.2
Middle and lower elevation species			
Douglas-fir		8,547.3	27.9
Ponderosa pine		2,927.6	9.6
Western white pine		1,323.3	4.3
Western larch		1,422.8	4.6
Grand fir and white fir		4,336.9	14.2
Western hemlock		1,403.3	4.6
Western redcedar		1,913.4	6.3
	TOTAL	21,874.6	71.5
Hardwoods			
Aspen		276.4	.9
Cottonwood		123.9	.4
	TOTAL	400.3	1.3
All species	TOTAL	30,586.5	100

About 72 percent of the total is at middle and lower elevations.

For the most part, the middle elevation and lower elevation species are the more valuable, generally have lower costs for harvest, and therefore represent the most stumpage value to the land manager. This is reflected in the ownership of these species groups. Forest industry owns about 9 percent of the middle elevation group but only 4 percent of the hardwoods and 3 percent of the high elevation group. National Forests have 85 percent of the volume of high elevation species. Other public and nonindustrial private owners have nearly 79 percent of the hardwood growing-stock volume (fig. 6). Growing-stock volumes by species and ownership are presented in detail in table 19 in the appendix. The pattern of ownership and species is about the same for sawtimber as for all growing stock (table 20 in appendix).

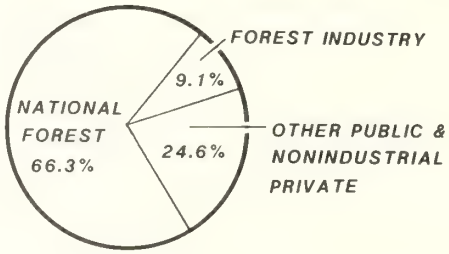
HIGHER ELEVATION SOFTWOOD SPECIES

LODGEPOLE PINE
ENGELMANN SPRUCE
SUBALPINE FIR
WHITEBARK PINE



MID TO LOWER ELEVATION SOFTWOOD SPECIES

DOUGLAS-FIR
PONDEROSA PINE
WESTERN WHITE PINE
WESTERN LARCH
GRAND FIR-WHITE FIR
WESTERN HEMLOCK
WESTERN REDCEDAR



HARDWOOD SPECIES

ASPEN
COTTONWOOD

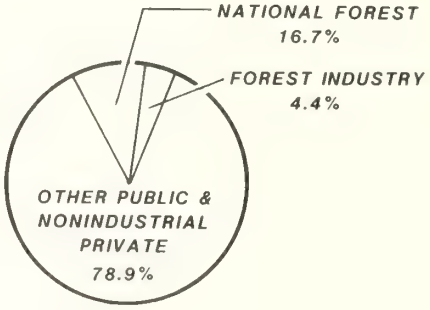


Figure 6—Occurrence of forest types in Idaho by elevational range and percentage of growing-stock volume by owner group, 1981.

Volume by Diameter Class

About half of the total volume is in small-sawlog size trees.

Tree size is an important consideration in harvesting and utilization. For the softwoods, almost half the growing-stock volume is in trees in the 10- to 18-inch d.b.h. classes (9.0 to 18.9 inches), about a third in the 20-inch and over class, and the remainder in pole-size trees (table 4, and table 21 in appendix). For softwood sawtimber only, just over half is in the 10- to 18-inch categories, the remainder in 20-inch and over. These categories give some indication of the type of use potential and processing involved. Pole-size trees (5.0 to 8.9 inches) provide posts, poles, and similar roundwood products; the larger size poles provide houselogs, converter poles, and to some extent are used as small sawlogs, particularly where high-speed chipping headrigs produce squared cants at low cost. The 10- to 18-inch group can be considered as small sawlogs and are commonly processed on high-speed headrigs such as chipping headrigs or multiple saw headrigs that saw the entire log at one pass.

Table 4.--Softwood volume by diameter class

Diameter class	Softwood growing stock		Softwood sawtimber	
	Billion ft³	(Percent)	Billion bd ft	(Percent)
6 to 8 inches	4.7	15.6	--	--
10 to 18 inches	14.7	48.6	72.0	54.1
20 inches and over	10.8	35.8	61.1	45.9
TOTAL	30.2	100	133.1	100

Larger trees (greater than 20 inches d.b.h.) are more valuable.

For logs over 20 inches d.b.h., potential for recovering higher grade and more valuable lumber is such that it often pays to break down the log on a headrig that permits turning the log to maximize grade recovery. Of course, logs may not always end up at the mill that exactly matches the ideal processing, but these diameter groups give a general idea of the potential for Idaho logs. Plywood mills would also generally prefer the larger size logs for grade and economy of production, but it is technically possible to peel fairly small logs down to a 3-inch core.

Tree size varies by species.

As might be expected, considerable variation exists in diameter distribution among species. Figure 7 shows volume by diameter classes for three major species—lodgepole, ponderosa, and Douglas-fir. For Douglas-fir, the biggest volumes are in the 12- to 18-inch classes, with an additional concentration in the large trees, 30 inches and over. In contrast, lodgepole pine volume is nearly all in the under 14-inch diameters with virtually no large-diameter trees. And ponderosa has a fairly even distribution of volumes across diameters, except a large proportion, over a third of the sawlog volume, in trees 30 inches and larger. Western redcedar also tends to have a larger proportion of the volume in large trees, while subalpine fir tends toward smaller trees similar to lodgepole pine. For the other softwood species, the volume distribution is most similar to Douglas-fir—that is, concentrated in the "middle" diameters 12 to 18 inches or so. (Detailed data on number of trees and volumes by diameters are in tables 16, 21, 22, and 23 in appendix.)

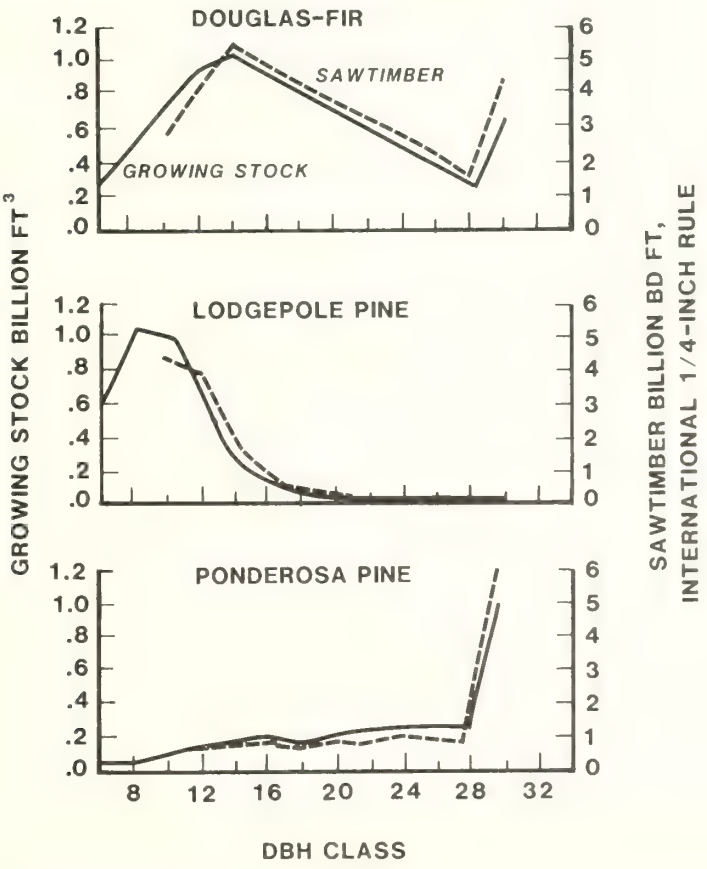


Figure 7—Distribution of growing-stock volume by diameter class for three major timber species in Idaho, 1981.

CHANGES IN IDAHO FOREST LAND

Changes at a glance (1980).

Idaho's forest lands are undergoing changes continually. In the beginning of this report changes in land status and classification were noted. While these could be viewed as only "paper" changes, the status of lands can have profound consequences as far as use and management are concerned. In addition are biological changes. This section discusses these changes—growth, mortality, and removals through harvest or other management activity.

Growth, Mortality, and Removals

Gross growth was 763 million cubic feet, but mortality and removals held the net increase in inventory to 281 million cubic feet.

Changes in Idaho's forest lands are summarized in table 5. Total growth was about 0.7 billion cubic feet of growing stock, and about 3.4 billion board feet of sawtimber alone. Through mortality and removals, the net change in inventory was a small net increase of about 0.3 billion cubic feet for all growing stock, and about 0.8 billion board feet (International ¼-inch rule) of the sawtimber component. Softwoods account for most of the harvest. Removals for softwood are about three times as much as mortality, but mortality is about triple the harvest for hardwoods. Hardwood volume is increasing at a much faster rate than is softwood, based on the change in inventory, mostly because of the small proportion of the inventory being harvested.

Table 5.--Summary of components of change, Idaho timberlands, 1980

Component	Growing stock			Sawtimber		
	Total	Softwood	Hardwood	Total	Softwood	Hardwood
	- - Million cubic feet - -			- - Million board feet - -		
Gross growth	763.1	742.6	20.5	3,448.7	3,415.4	33.3
Mortality	115.0	112.0	3.0	512.9	508.6	4.3
Net growth	648.1	630.6	17.5	2,935.8	2,906.8	29.0
Timber removal	367.2	366.1	1.1[1]	2,115.7	2,109.2	6.5
Net change	+280.9	+264.5	+16.4	+820.1	+797.6	+22.5
Change as percent of inventory	+ 0.9	+ 0.9	+ 4.1	+ 0.6	+ 0.6	+ 2.9

[1]Includes minor volumes of limber and whitebark pines.

Components of change were opposite on public and private lands.

These changes, however, are not equal for all ownerships. On public lands, mortality is fairly large in relationship to growth, and removals are considerably less than net growth (fig. 8). Private lands show a different picture. Mortality is relatively low on industry lands, and on both industry and nonindustrial private lands removals are greater than net growth. In the case of sawtimber, industry removal is about twice as much as net growth. This indicates differences in management objectives, types of timber and their accessibility, and constraints placed on some public lands. In general, growth and removals will ultimately need to be in balance, but the transition from a virgin, unmanaged forest to a long-term balance may take decades to achieve.

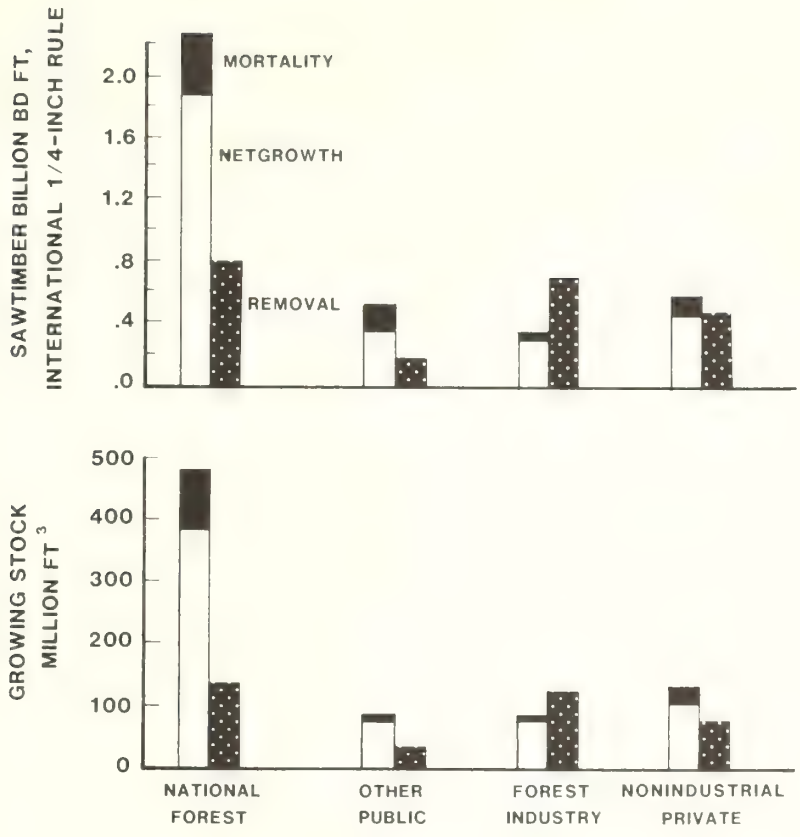


Figure 8—Mortality, net growth, and removals of growing stock and sawtimber volume in Idaho by owner group, 1980.

Management objectives affect the kinds and rates of change between owner groups.

The inventory of sawtimber on public lands is increasing at just over 1 percent per year, nonindustrial private is decreasing by a fraction of a percent, and forest industry is decreasing by about 4.5 percent (table 6). Several reasons account for this situation, including a shift to more private land harvest during the late 1970's when harvest on National Forests was reduced; also, corporate ownerships may have different criteria regarding rotation ages and harvesting of mortality-prone and slow-growing, old-growth stands.

Table 6.--Net growth, removal, and change in sawtimber by ownership, 1980

	National Forest	Other public	Forest industry	Nonindustrial private
	- - - - - - - - - - - - Million board feet - - - - - - - - - - - -			
Net growth	1,866	377	263	429
Removal	790	186	699	441
Net change	+1,076	+191	-436	- 12
Change as percent of inventory	+ 1.1	+ 1.2	- 4.5	- 0.1

Causes of Mortality

Insects, disease, and weather were the major causes of mortality.

Although wildfire is the most spectacular killer of trees, two "silent killers," diseases and insects, take a far greater toll and account for well over half the cubic volume of growing-stock mortality. Because many destructive agents often attack trees in concert or in succession, it is often difficult to identify the actual causal agent. When the primary cause of death cannot be precisely determined, it is listed as unknown:

Cause of death	Percent of mortality
Insects	19.2
Disease	34.3
Weather	14.3
Suppression	4.0
Logging	1.7
Fire	0.2
Unknown	26.3

It is likely that much of the mortality in the "unknown" category was precipitated by insects and diseases. In general, mortality is distributed among species in about the same proportion as their volume. However, there are several species for which this is not true:

Species	Percentage of growing stock volume	Percentage of mortality
Ponderosa pine	9.6	5.7
Western white pine	4.3	14.8
Subalpine fir	6.6	13.5

Detailed data of mortality by species and diameter are presented in table 33 in the appendix.

Productivity

Productivity of forest industry land is greater than on National Forests...

Although Idaho has some of the most productive forest land in the Nation, the productive potential of Idaho forest land averages about 82 cubic feet per acre per year and ranges from 56 cubic feet on National Forests to 107 cubic feet on forest industry land (tables 10 through 14 in the appendix). This potential is based on estimated cubic foot growth of fully stocked natural stands. The current annual net growth of timberland varies from about 42 cubic feet per acre per year on National Forest land to about 60 cubic feet on forest industry land (fig. 9), averaging about 46 cubic feet per acre over all owner groups. This is little more than half the productive potential of the land.

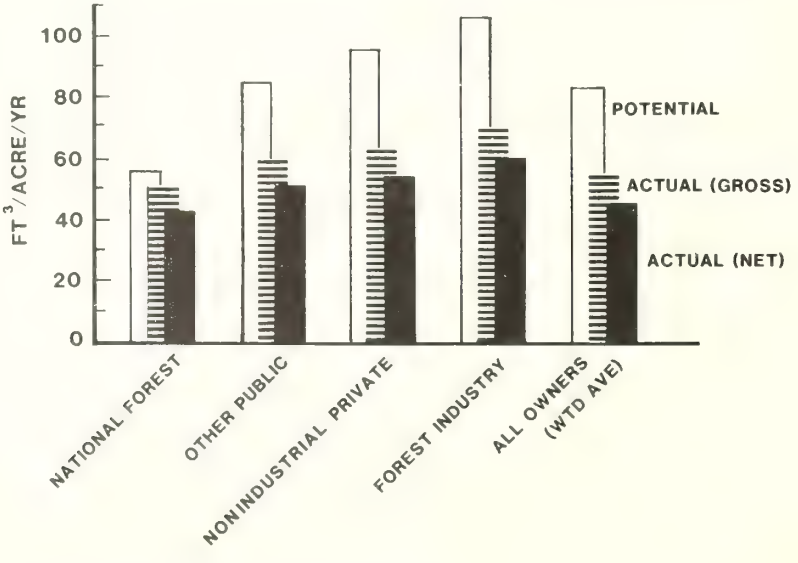


Figure 9—Potential, gross, and net annual growth of timberland in Idaho by owner group, 1980.

but only half the potential is being realized.

Note that this actual growth is **net** growth—that is, total volume gained through increment on live growing-stock trees plus the ingrowth of small trees into growing-stock size, minus the losses of mortality and the volume in trees that become cull. The losses average about 8 cubic feet per acre. If only the actual gross growth—the amount of new wood grown—is considered, the growth picture is somewhat better, averaging about 66 percent of the potential. This may be an important consideration depending on whether the interest is in the change in the size of the woodpile or in the extent to which the growth potential of the timberland is being realized.

Removals

Sawlog size trees are still emphasized in harvest.

Harvest for pulpwood has been gaining on sawlogs and veneer logs.

Sawlogs have historically been the most important product harvested from Idaho forest lands. In 1980, sawlogs accounted for 59 percent of the total removals (fig. 10). Veneer logs accounted for another 12 percent. These two products are the backbone of the wood products industry in the State, but pulpwood harvest has grown to a sizable volume, accounting for 14 percent of the removals. Miscellaneous products such as cedar products, poles, and houselogs are often valuable on a cubic-foot basis, but they accounted for a relatively small volume. Over 10 percent of the removals from growing stock is left as logging residues—that is, within the definition of growing-stock volume, but not suited or removed for products.

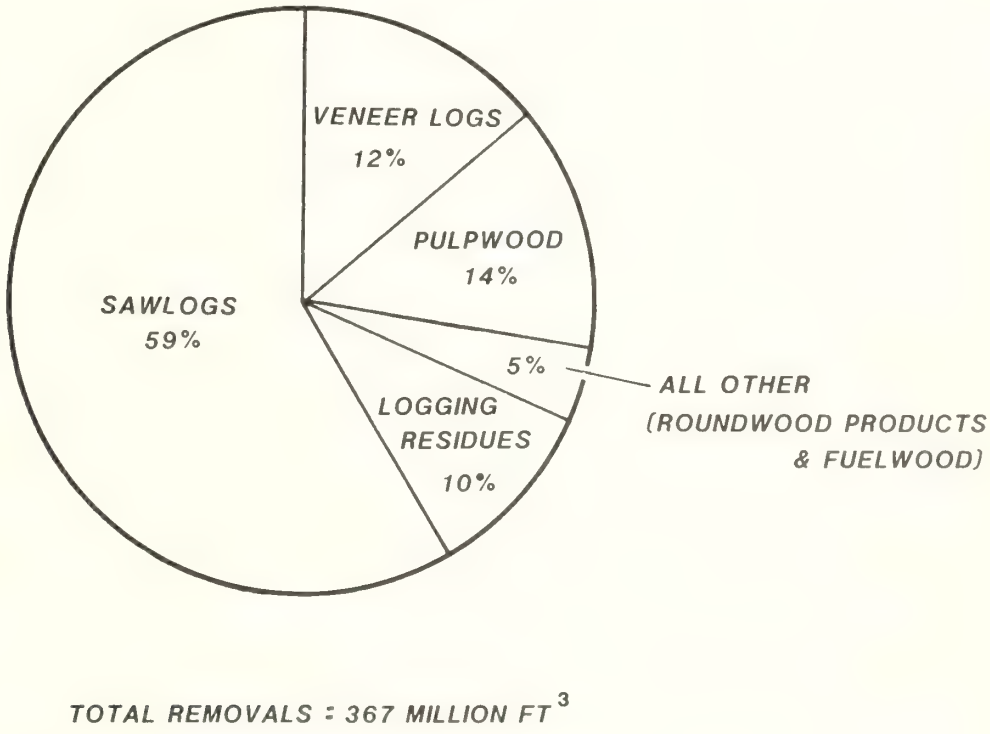


Figure 10—Total removals in Idaho by type of product, 1980.

The various ownerships differed in types of product removals. On National Forests, nearly three-fourths of the removals were for sawlogs and just over 6 percent for veneer logs. In contrast, forest industry land removals were less than half (45 percent) sawlogs, but 22.4 percent veneer logs. Forest industry also had the greatest proportion of pulpwood removals, 18.8 percent.

Economic necessity has diverted more sawlogs to veneer mills and pulp and paper plants.

A similar pattern is reflected in sawtimber removals. Forest industry used more of the sawlog volume removed for both veneer logs and pulpwood than the average for all owners. The increases in pulpwood harvest and use of sawtimber trees for pulpwood in 1980 were largely the consequences of the economic down-turn that began in late 1979. Mill closures and curtailed production dried up the supply of mill residues upon which pulp and paper companies relied as source of raw material. Round pulpwood harvest and the diversion of sawtimber trees from the headrigs to the chippers covered the shortage. Detailed data on removals are in tables 39 through 44 in the appendix.

Assessing Changes and Trends

Over the past decade the increase in growing-stock inventory on National Forests...

has compensated for a substantial reduction on forest industry and other lands...

resulting in a slight increase in standing volume.

The above discussions and the data have outlined the current status of Idaho's timber resource as of 1980, the base year for current inventory data. As pointed out early in the report, there have been some changes in the definitions and classifications of forest lands in the State. Because of this, direct comparison with previous data is not possible. However, it is of interest to look in rather broad terms how current status compares with the previous status, particularly with regard to inventory and changes in volume of timber for commercial use.

Table 7 shows area, volume, and volumes per acre for the entire State and for National Forests and forest industry lands. These two ownerships have historically provided most of the commercial harvest, and most interest on future harvest centers around levels of output for these two owners. In 1980 the land considered the timber growing and harvest base increased by over 3 million acres with the addition of lower productivity land into the timberland category. Compared to 1970, there is a slight increase in growing-stock volume from 2,077.7 cubic feet per acre to 2,183.8 cubic feet per acre overall. National Forest lands increased by about 400 cubic feet per acre, forest industry decreased by about 1,200 cubic feet per acre, and all other ownerships decreased by about 300 cubic feet per acre.

Table 7.--Comparison of timberland area and growing-stock volume, 1970 and 1980

Item	Commercial forest land, 1970	Timberland, 1980
	- - - - - - - - - - - - Thousand acres - - - - - - - - - - - -	
Area		
Total	14,196.9	14,006.3 (+3,654.3)
NF	9,735.8	9,153.2 (+3,654.3)
Forest industry	946.7	1,178.1
All other	3,514.4	3,765.0
	- - - - - - - - - - - - Million cubic feet - - - - - - - - - - - -	
Growing stock inventory		
Total	29,497.3	30,586.5[1]
NF	19,269.5	21,655.9[1]
Forest industry	2,940.3	2,284.5
All other	7,287.5	6,646.1
	- - - - - - - - - - - - - - Cubic feet - - - - - - - - - - - - - -	
Growing stock volume per acre		
Total	2,077.7	2,183.8[1]
NF	1,979.2	2,365.0[1]
Forest industry	3,105.8	1,939.1
All other	2,073.6	1,765.2

[1]3,654.3 thousand acres of National Forest not included in computing the volume or volume per acre figures.

In terms of changes in growing stock, mortality decreased by half, net growth decreased slightly, and removals remained about the same (table 8). Converting these totals to per-acre figures, mortality has decreased by nearly half, net growth per acre increased slightly, and, again, removals are virtually the same.

Even though, because of changes in definitions, the 1970 and 1980 data are not strictly comparable, in general terms they do reflect gradual change in the forest lands used for timber harvesting. This is because harvest is gradually converting older stands with high mortality rates to younger, more productive stands while still maintaining growing-stock levels in the State.

Data from two points in time give reasonable growth and mortality trends.

The inventories used in developing these analyses are undertaken at approximately 10-year intervals. Therefore, the data pertain to a given year. While growing-stock inventories, mortality, and net growth tend to change rather slowly over time, the data can probably be considered a reasonable picture for the whole decade. However, annual harvest levels can fluctuate widely depending on markets for wood products and on other factors. Therefore, it is of interest to know how closely the periodic estimates of removals compare with year-to-year harvest trends.

Table 8.--Comparison of growing-stock changes, 1970 and 1980

Item	1970	1980
	- - - - - - Million cubic feet - - - - - -	
Mortality	201.8	115.0
Net growth	503.0	648.1
Removal	357.2	367.2
	- - - - - - Cubic feet per acre - - - - - -	
Annual mortality	14.85	8.21
Annual net growth	35.43	46.27
Annual removal	25.16	26.22

Interim removals data indicate a general trend that results in comparable inventory volume change.

Figure 11 shows 1970 and 1980 removals of growing stock compared with harvest from 1969 to 1984 (from unpublished records compiled by USDA Forest Service, Northern Region, Missoula, MT). The annual harvest data are based on log volumes received at the mill and are reported in Scribner log scale. The 1970 and 1980 removals are shown in both International ¼-inch rule and Scribner scale. Because log receipts don't include growing stock that was not taken from the forest to the mill (damaged trees and so on), the total removals from inventory are slightly higher than reported harvest for the corresponding year. For the period 1970 to 1980, the removals reported from survey data reflect fairly closely the harvests for the intervening years. However, depressed wood markets in the early 1980's dropped harvest levels well below the previous 10-year period.

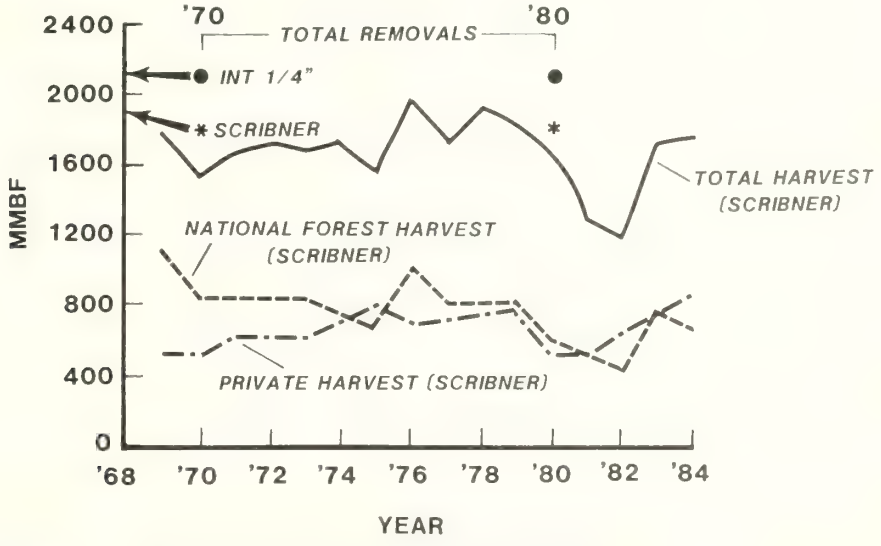


Figure 11—Trends and changes in sawtimber harvest and removals in Idaho, 1969 to 1984.

Figure 11 also shows annual harvest for two owner groups, National Forest and private. Data on harvests do not separate forest industry from other private owners, but usually industry accounts for half or more of the private land removals. For both

National Forests and private lands, removals fluctuated considerably from year to year. But from 1969 to 1984 the general trends were for removals from National Forests to decrease and private land removals to increase.

Finally, another perspective on growth and changes in Idaho forest land can be gained by comparing estimated rates of change that net growth and removal data indicate with the actual changes in inventory. For the two inventory periods, estimated growth and removals were:

	1970	1980
Net annual growth per acre, cubic feet	35.43	46.27
Annual removals per acre, cubic feet	−25.16	−26.22
Net annual change per acre, cubic feet	+10.27	+20.05

Growing-stock levels are slowly increasing on the average acre.

From 1970 to 1980, the estimated increase in growing stock inventory was 106.1 cubic feet per acre (2,077.7 to 2,183.8 from table 7). On an average annual basis, this is about 10.6 cubic feet per acre per year, slightly above the estimated net change per year for 1970 but less than the change indicated for 1980.

NONTIMBER USES OF IDAHO FOREST LAND

Nontimber values and uses in Idaho's forests are high.

While the management and harvest of timber is the most common use of Idaho's forest resource, forested lands provide many other outputs and benefits, both commodity and noncommodity. The management and uses of these nontimber resources are complex and are discussed at length in the various plans and use reports of the forest land management agencies and individuals involved. Our intent here is to briefly present a picture of current use levels for these resources to provide some perspective on how they fit into the total forest resource picture.

Grazing

Forest land in southern Idaho is a more important grazing resource than the more extensive and dense timber stands in the north.

The history of grazing in Idaho is similar to most of the West. In the early days of open range, cattle and sheep were grazed extensively, and overgrazing often occurred. As the land was brought under management, grazing levels were reduced. In some areas range rehabilitation was undertaken to reduce erosion and improve range productivity. In general, grazing on forest land is inverse to timber growing. In the southern portion of the State, forest and timberlands are often in patches and stringers interspersed with grasslands and brush, and grazing is often the most important use of the forest. In the northern part of the State where continuous stands of heavy timber predominate, grazing is relatively minor, although natural openings, high-altitude meadows, and areas converted to pasture lands after timber harvest are of local importance.

Forest land contributes significantly to the livestock industry in the State.

Complete data on the portion of the State's grazing and livestock industry that is tied to forest land are not available, but historically the Forest Service lands have provided a large portion of what would be considered forest land grazing. During the past 15 years or so total grazing expressed in animal unit months (AUM's) increased by about a quarter, from about 650,000 AUM's to over 800,000 AUM's in recent years (fig. 12). Most of this change has been an increase in both number and AUM's of cattle grazing. Grazing of sheep and other major livestock has fluctuated over the years, but AUM's have increased. Number of sheep grazing has actually decreased, which indicates that while fewer sheep are being run on forest land, they are grazing for a longer period. These data should be considered only indicative of trends because changes in reporting and data gaps make precise comparisons of years difficult. Horse and burro grazing is a minor part of the grazing use, and data on these have not been compiled until recent years. In 1984 about 15,000 domestic horse and 60 wild horse and burro AUM's were recorded for National Forests.

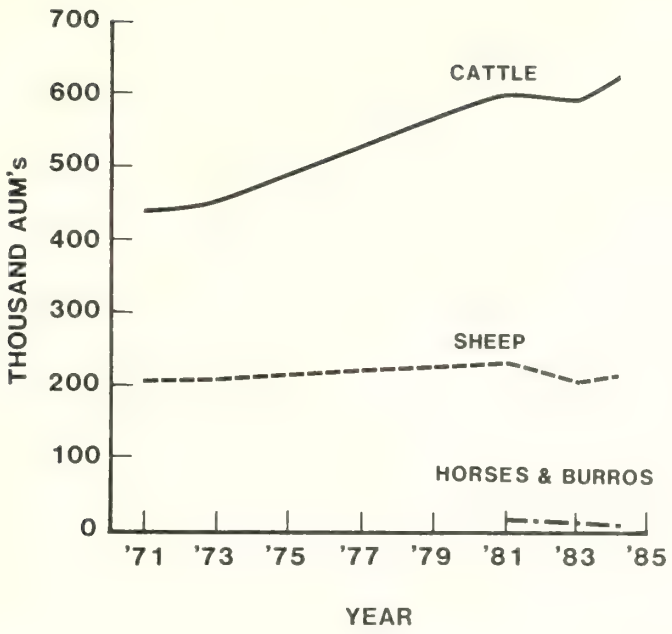


Figure 12—Grazing levels in animal unit months on National Forests in Idaho, 1971 to 1985.

About 34 million acres of Idaho lands are grazed (Pizzadili and McKetta 1979). National Forest grazing land accounts for about 12 million acres, BLM about 11 million acres, and grazing on forested lands of private owners about 0.8 million acres. It is apparent that forest lands make an important contribution to the livestock industry.

Wildlife

Wildlife rely heavily on the forest land for food and cover, particularly on the National Forests.

An important use of forest land is providing food and cover for wildlife. One recent report indicated about 1.2 million AUM's of wildlife use on Federal lands and about 0.9 million on National Forests. Forest-related wildlife, particularly deer, elk, and moose, derive from 60 to 90 percent of the total AUM's from these Federal lands (Pizzadili and McKetta 1979).

Water and Soil

Management of forest resources is designed to protect the land base and water quality...

As in most Western States, a large part of Idaho's water originates in the mountainous forested areas. Foresters are learning more and more about how harvesting practices can affect water yield, timing, runoff, etc. (Cline and others 1977). However, any large-scale actual manipulation of water by forest management is probably not in the immediate future. What is of immediate concern is the effect of logging, mining, and attendant road building on water quality and sedimentation, especially in the batholith area of central Idaho (Platts and others 1979; Snyder and others 1975).

but increase the cost of timber.

Logging several decades ago, without any special efforts to reduce erosion, resulted in substantial silting in spawning streams for salmon and steelhead trout. Research and management efforts have restored some of the damaged areas, and harvesting operations now are designed to minimize erosion and silting. Recent studies indicate that two-thirds of the timber sales in Idaho's National Forests have modified layout, road design, and construction to protect soil and water, and these measures add an average of several dollars per thousand board feet in logging costs (Schuster and others 1984; Benson and Niccolucci 1985).

Mining

Historically, gold and silver mining paved the way for development and settling of Idaho. Many small mines flourished a short time. A few have survived and grown. Remnants of mines and exploration holes can be found in even remote parts of the forested lands of central and northern Idaho.

The value of minerals underlying forest lands is enormous...

and their development is carefully planned to avoid major negative impacts.

More recently, phosphate mining and exploration for oil in the overthrust belt have shifted much attention to the forests of southeastern Idaho. While drilling, mining, and related activities don't have much direct impact on the forest in terms of acres, of concern are the road developments and impacts of mines, tailings, and facilities on nontimber forest resources and uses such as wildlife, landscape, and recreation. National Forest managers have taken these into account in forest planning efforts, and guidelines for future activities, plus rehabilitation for some past activities, are aimed at minimizing negative impacts of mining. (For example, see Caribou National Forest and Curlew National Grassland Land and Resource Management Plan, Caribou National Forest, Pocatello, ID, 1985.)

Recreation

Forest-related recreation is big business.

Outdoor recreation has grown steadily over most of the past 2 decades, and much of this recreation is on forest land. Recreation visitor data are not usually kept separately for forest land, but on three major public ownerships over 13 million visits were counted in 1981 (fig. 13), and much of this involved forest-based recreation.

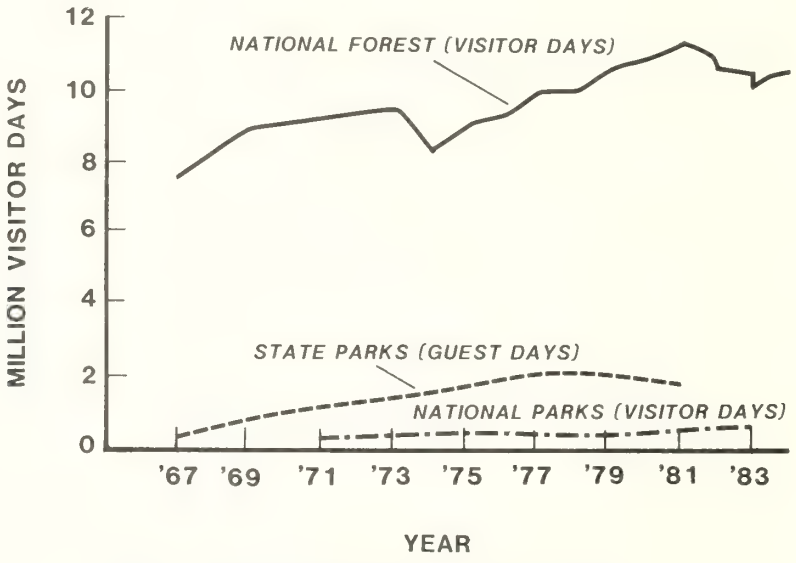


Figure 13—Recreation visits on three major public ownerships in Idaho, 1967 to 1983.

The most detailed data on recreation visits are kept for National Forests. In 1984 Idaho National Forests reported about 10.5 million recreational visitor days (RVD's) (one visitor day equals 12 hours of use by one person) (USDA-FS 1985). Visitors engaged in the following activities:

In 1984 the National Forests alone hosted 10.5 million RVD's.

	Million visitor days
Mechanized travel	2.3
Camping	2.6
Hiking (including climbing)	.4
Picnicking	.3
Hunting	.8
Fishing	.8
Snow sports	.5
Other	2.8
Total	10.5

The "go togethers" of camping, hunting, and fishing account for about 40 percent of the recreational activities. In its 1983 State Comprehensive Outdoor Recreation Plan (SCORP) the Idaho Department of Parks and Recreation estimated recreation use for 1980 in numerous activities, including several that are fairly comparable to National Forest statistics. Although the definitions of "visits" are somewhat different, in several categories National Forests provide a sizable portion of the total activity:

	Million visitor days		
	SCORP	NF's	NF percentage
Camping	9.0	2.6	32
Hunting	4.7	.8	17
Mechanized travel (driving)	22.8	2.3	11
Eight "forest-based" activities, total	69.3	10.5	15

Because SCORP counts an activity for any part of a day, the National Forests probably account for an even greater share of the recreation than this rough comparison indicates.

The growth in recreation use of forests led to increased facilities, budgets, and management on the part of major forest land owners, particularly in the 1960's when many new camping and other visitor facilities were built. Recreational use has also led to modification in timber harvesting to accommodate and protect the forest recreation resource.

Still debated: wilderness vs. commodity uses.

Wilderness areas have been a point of particular interest (and frequent controversy) in forest land use and management. Although wilderness areas are established for a variety of purposes, debate over wilderness designations usually brings in recreational use, probably the most evident wilderness use. Historically, Idaho has had extensive "primitive" areas, and in 1980 formal designation of some large tracts such as the Frank Church-River of No Return Wilderness tripled the formal wilderness acreage. Apparent wilderness visits have increased steadily, but because of the changes in wilderness status, the data on visits need to be carefully interpreted. Since 1965 the area of and visits to wilderness have increased sharply (fig. 14). The significance of the wilderness areas to the timber resource lies in the fact that when the formal designation is established there is a better picture of the remaining timberland base on which management and harvest activities can be planned with more certainty.

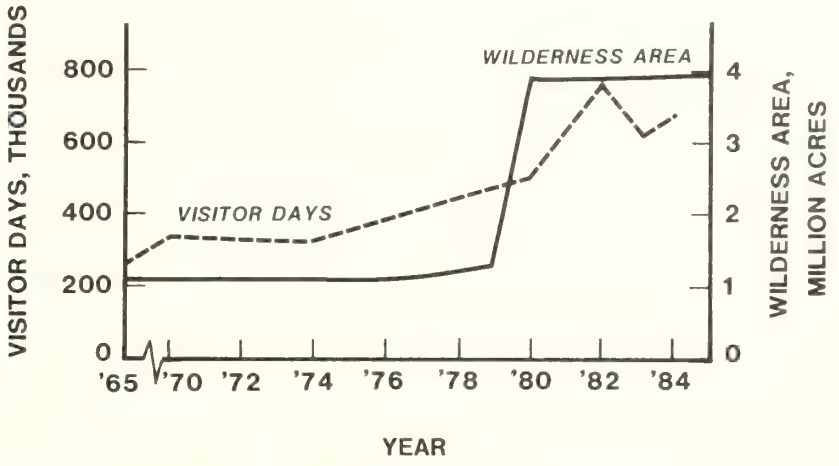


Figure 14—Acres and visitor days in wilderness areas on National Forests in Idaho, 1965 to 1984.

Idaho has many major rivers that are heavily used for recreation, and some are designated or are under study for wild and scenic or recreational river status. Most of these rivers are in forested areas, and while measures to protect water quality on these streams will be part of any harvesting or management activity, probably the bigger impact will be the controls on location and type of development, such as roads, that will be allowed in order to protect the wild and recreational values.

By 1983 nearly 750 miles of rivers had been designated for protection, and another 600 miles were proposed for study.

In 1972, two rivers, Clearwater and Middle Fork Salmon, totaling 257 miles were designated as wild, scenic, and recreation rivers, and another 1,105 miles were proposed for study (Idaho Department of Parks and Recreation 1973). By 1983 there were 578 miles of wild and scenic rivers plus 167 miles of recreation rivers designated (Idaho Department of Parks and Recreation 1983) (fig. 15).

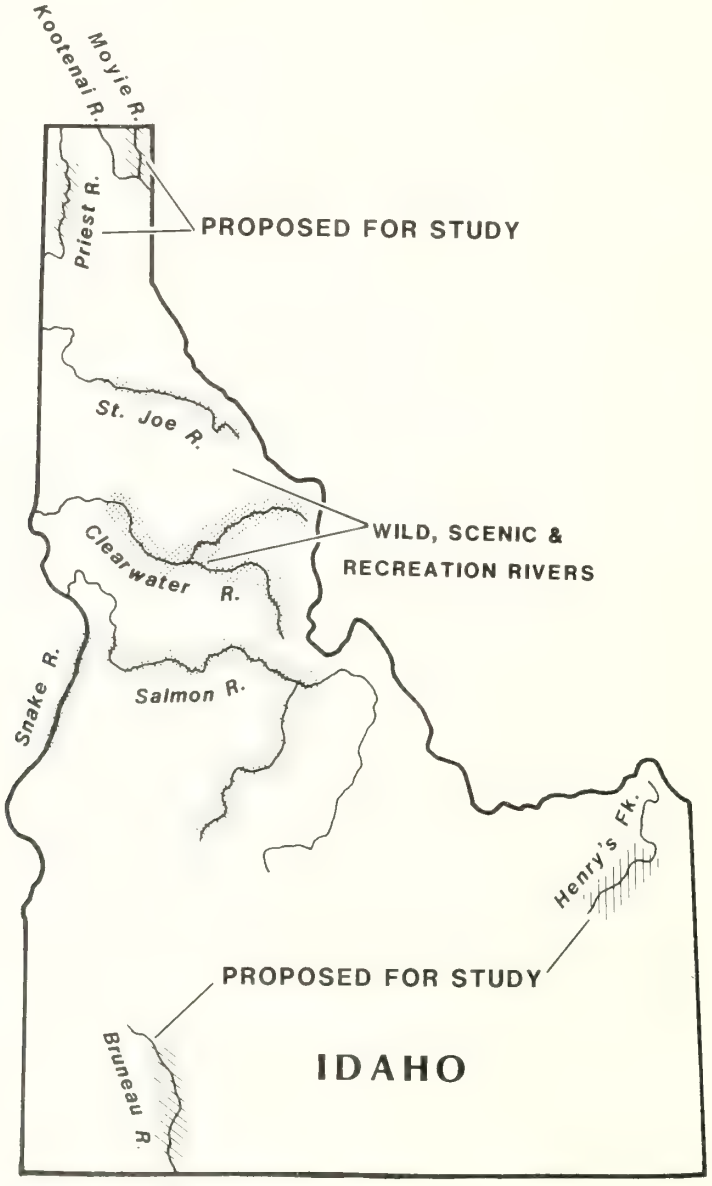


Figure 15—Existing and proposed Wild, Scenic, and Recreation Rivers in Idaho, 1983.

Employment in Forest Products

Idaho's forests are the foundation for a significant part of the State's economy...

with the wood products industry as the centerpiece.

Recent economic factors are signaling changes in production and markets.

For many Idaho residents the most important forest resource use statistic lies in the paycheck—the number of jobs produced from use of the forest resource. For some uses (grazing, recreation, mining) the forest resource plays a relatively small role, or the employment due to forest-related portions cannot be readily identified. But in the case of wood products, accurate data are available, and the employment effects of wood processing are direct and important.

Total nonmanufacturing employment in Idaho grew from about 250,000 in the early 1970's to about 325,000 in the early 1980's, and remained at about that level since. Lumber and wood products employment also grew rapidly up through the late 1970's but since then has plunged from nearly 19,000 in 1978 to under 14,000 in 1984 (Idaho Department of Employment, monthly statistics) (fig. 16). Many reasons are cited including shortage and costs for timber, market slumps due to high interest rates, and foreign competition for wood markets. Whatever the causes, the past few years probably represent a transition both for Idaho forest products industry and markets for Idaho's wood products. In turn, the current changes and trends in the next few years will probably set the pace for the future demands on the timber portion of Idaho's forest resources.

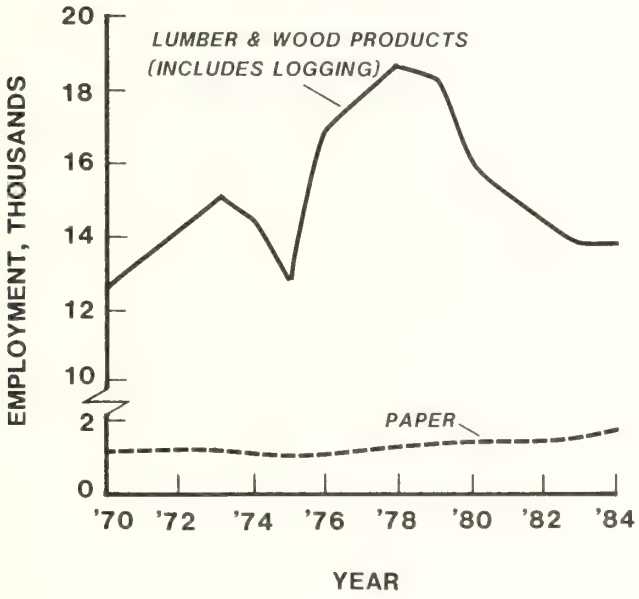


Figure 16—Employment in Idaho's wood products industry, 1970 to 1984.

REFERENCES

Benson, Robert E.; Niccolucci, Michael J. Cost of managing nontimber resources when harvesting timber in the Northern Rockies. Research Paper INT-351. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station; 1985. 78 p.

Cline, Richard L.; Haupt, Harold F.; Campbell, Gaylon S. Potential water yield response following clearcut harvesting on north and south slopes in northern Idaho. Research Paper INT-191. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1977. 16 p.

Green, Alan W.; Van Hooser, Dwane D. Forest resources of the Rocky Mountain States. Resource Bulletin INT-33. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1983. 127 p.

Idaho Department of Employment. Idaho employment. Boise, ID: Idaho Department of Employment. [Monthly, various issues].

Idaho Department of Parks and Recreation. Idaho outdoor recreation, 1973. Boise, ID: Idaho Department of Parks and Recreation; 1973. 388 p.

Idaho Department of Parks and Recreation. State comprehensive outdoor recreation plan. Boise, ID: Idaho Parks and Recreation Department; 1983.

Pizzadili, James; McKetta, Charles. Idaho's wildland resources. Availability and Use Report 171. Moscow, ID: University of Idaho, Forestry, Wildlife and Range Experiment Station; 1979. 141 p.

Platts, William S.; Martin, Susan B.; Primbs, Edward R. J. Water quality in an Idaho stream degraded by acid mine waters. General Technical Report INT-67. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1979. 19 p.

Schuster, Ervin G.; Keegan, Charles E., III; Benson, Robert E. Provisions for protecting and enhancing nontimber resources in Northern Region timber sales. Research Paper INT-326. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1984. 9 p.

Snyder, Gordon A.; Haupt, Harold F.; Belt, George H., Jr. Clearcutting and burning slash alter quality of stream water in northern Idaho. Research Paper INT-168. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1975. 34 p.

U.S. Department of Agriculture, Forest Service. Report of the Forest Service, 1984. Washington, DC; 1985. 153 p.

Van Hooser, Dwane D.; Green, Alan W. Idaho's State and private forest resource. Resource Bulletin INT-37. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station; 1985. 78 p.

APPENDIX I: TERMINOLOGY

Acceptable trees—Growing-stock trees meeting specified standards of size and quality, but not qualifying as desirable trees.

Area condition class—A classification of timberland reflecting the degree to which the site is being utilized by growing-stock trees and other conditions affecting current and prospective timber growth (see Stocking):

Class 10—Areas fully stocked with desirable trees and not overstocked.
Class 20—Areas fully stocked with desirable trees, but overstocked with all live trees.
Class 30—Areas medium to fully stocked with desirable trees and with less than 20 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.
Class 40—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees, or conditions that ordinarily prevent occupancy by desirable trees, or both.
Class 50—Areas poorly stocked with desirable trees, but fully stocked with growing-stock trees.
Class 60—Areas poorly stocked with desirable trees, but with medium to full stocking of growing-stock trees.
Class 70—Areas nonstocked or poorly stocked with desirable trees, and poorly stocked with growing-stock trees.
Class 80—Low-risk old-growth stands.
Class 90—High-risk old-growth stands.
Nonstocked—Areas less than 10 percent stocked with growing-stock trees.

Basal area—The cross-sectional area of a tree expressed in square feet. For timber species the calculation is based on diameter at breast height (d.b.h.); for woodland species it is based on diameter at root collar (d.r.c.).

Cord—A pile of stacked wood containing 128 cubic feet within its outside standard dimensions of 4 by 4 by 8 feet.

Cull trees—Live trees that are unmerchantable now or prospectively (see Rough trees and Rotten trees).

Cull volume—Portions of a tree's volume that are not usable for wood products because of rot, form, missing material, or other cubic-foot defect. Form and sound defects include severe sweep and crook, forks, extreme form reduction, large deformities, and dead material.

Deferred forest land—Forest lands within the National Forest System that are under study for possible inclusion in the Wilderness System.

Desirable trees—Growing-stock trees (1) having no serious defect in quality to limit present or prospective use for timber products, (2) of relatively high vigor, and (3) containing no pathogens that may result in death or serious deterioration within the next decade.

Diameter at breast height (d.b.h.)—Diameter of the stem measured at 4.5 feet above the ground.

Diameter at root collar (d.r.c.)—Diameter equivalent at the point nearest the ground line that represents the basal area of the tree stem or stems.

Diameter classes—Tree diameters, either d.b.h. or d.r.c., grouped into 2-inch classes labeled by the midpoint of the class.

Farmer-owned lands—Lands owned by a person who operates a farm and who either does the work or directly supervises the work.

Forest industry lands—Lands owned by companies or individuals operating a primary wood-processing plant.

Forest land—Land at least 10 percent stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.

Forest trees—Woody plants having a well-developed stem or stems, usually more than 12 feet in height at maturity, with a generally well-defined crown.

Forest type—A classification of forest land based upon and named for the tree species presently forming a plurality of live-tree stocking.

Growing-stock trees—Live sawtimber trees, poletimber trees, saplings, and seedlings of timber species meeting specified standards of quality and vigor; excludes cull trees.

Growing-stock volume—Net cubic-foot volume in live growing-stock trees from a 1-foot stump to a minimum 4.0-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.

Growth—See definition for Net annual growth.

Hardwood trees—Dicotyledonous trees, usually broad-leaved and deciduous.

High-risk old-growth stands—Timber stands over 100 years old in which the majority of the trees are not expected to survive more than 10 years.

Indian lands—Indian lands held in trust by the Federal Government.

Industrial wood—All commercial roundwood products except fuelwood.

Land area—The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains, streams, sloughs, estuaries, and canals less than 120 feet wide; and lakes, reservoirs, and ponds less than 1 acre in size.

Logging residues—The unused portions of growing-stock trees cut or killed by logging.

Low-risk old-growth stands—Timber stands over 100 years old in which the majority of the trees are expected to survive more than 10 years.

Miscellaneous Federal lands—Lands administered by Federal agencies other than the U.S. Department of Agriculture, Forest Service or U.S. Department of the Interior, Bureau of Land Management.

Mortality—The net volume of growing-stock trees that have died from natural causes during a specified period.

National Forest lands—Public lands administered by the U.S. Department of Agriculture, Forest Service.

National Resource lands—Public lands administered by the U.S. Department of the Interior, Bureau of Land Management.

Net annual growth—The net average annual increase in the volume of trees during a specified period.

Net volume in board feet—The gross board-foot volume in the sawlog portion of growing-stock trees, less deductions for cull volume.

Net volume in cubic feet—Gross cubic-foot volume in the merchantable portion of trees less deductions for cull volume. For timber species, volume is computed for the merchantable stem from a 1-foot stump to a minimum 4.0-inch top diameter outside bark, or to the point where the central stem breaks into limbs. For woodland species, volume is computed outside bark (o.b.) for all woody material above d.r.c. that is larger than 1.5 inches in diameter (o.b.).

Nonforest land—Land that does not currently qualify as forest land.

Nonindustrial private—All private ownerships except forest industry.

Nonstocked areas—Forest land less than 10 percent stocked with live trees.

Old-growth stands—Stands of timber species over 100 years old.

Other private land—Privately owned land other than forest industry or farmer-owned.

Other public land—Public land administered by agencies other than the U.S. Department of Agriculture, Forest Service.

Other removals—The net volume of growing-stock trees removed from the inventory by cultural operations such as timber-stand improvement, by land clearing, and by changes in land use, such as a shift to wilderness.

Poletimber stands—Stands at least 10 percent stocked with growing-stock trees, in which half or more of the stocking is sawtimber or poletimber trees or both, with poletimber stocking exceeding that of sawtimber (see definition for Stocking).

Poletimber trees—Live trees of timber species at least 5.0 inches d.b.h. but smaller than sawtimber size.

Potential growth—The average net annual cubic-foot growth per acre at culmination of mean annual growth attainable in fully stocked natural stands.

Primary wood-processing plants—Plants using roundwood products such as sawlogs, pulpwood bolts, veneer logs, etc.

Productivity class—A classification of forest land in terms of potential growth.

Removals—The net volume of growing-stock trees removed from the inventory by harvesting, cultural operations, land clearings, or changes in land use.

Reserved forest land—Forest land withdrawn from tree utilization through statute or administrative designation.

Residues:

Coarse residues—Plant residues suitable for chipping, such as slabs, edgings, and ends.
Fine residues—Plant residues not suitable for chipping, such as sawdust, shavings, and veneer clippings.
Plant residues—Wood materials from primary manufacturing plants that are not used for any product.

Rotten tree—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot), and with more than half of the cull volume attributable to rotten or missing material.

Rough tree—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot), and with less than half of the cull volume attributable to rotten or missing material.

Roundwood—Logs, bolts, or other round sections cut from trees.

Salvable dead trees—Standing or down dead trees that are currently merchantable by regional standards.

Saplings—Live trees of timber species 1.0 to 4.9 inches d.b.h., or woodland species 1.0 to 2.9 inches d.r.c.

Sapling and seedling stands—Timberland stands at least 10 percent stocked on which more than half of the stocking is saplings or seedlings or both.

Sawlog portion—That part of the bole of sawtimber trees between a 1-foot stump and the sawlog top.

Sawlog top—The point on the bole of sawtimber trees above which a sawlog cannot be produced. The minimum sawlog top is 7.0 inches diameter o.b. for softwoods, and 9.0 inches diameter o.b. for hardwoods.

Sawtimber stands—Stands at least 10 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber trees—Live trees of timber species meeting regional size and defect specifications. Softwood trees must be at least 9.0 inches d.b.h. and hardwood trees 11.0 inches d.b.h.

Sawtimber volume—Net volume in board feet of the sawlog portion of live sawtimber trees.

Seedlings—Established live trees of timber species less than 1.0 inch d.b.h. or woodland species less than 1.0 inch d.r.c.

Softwood trees—Monocotyledonous trees, usually evergreen, having needle or scalelike leaves.

Standard error—An expression of the degree of confidence that can be placed on an estimated total or average obtained by statistical sampling methods. Standard errors do not include technique errors that could occur in photo classification of areas, field measurements, or compilation of data.

Stand-size classes—A classification of forest land based on the predominant size of trees present (see Sawtimber stands, Poletimber stands, and Sapling and seedling stands).

State, county, and municipal lands—Lands administered by States, counties, and local public agencies, or lands leased by these governmental units for more than 50 years.

Stocking—An expression of the extent to which growing space is effectively utilized by present or potential growing-stock trees of timber species. Percentage stocking is the ratio of actual stocking to full stocking for comparable sites and stands, using basal area as the basis for comparison.

Timberland—Forest land where timber species make up at least 10 percent stocking.

Timber species—Tree species traditionally used for industrial wood products. In the Rocky Mountain States, these include aspen and cottonwood hardwood species and all softwood species except pinyon and juniper.

Timber stand improvement—Treatments such as thinning, pruning, release cutting, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.

Upper-stem portion—That part of the main stem or fork of sawtimber trees above the sawlog top to a minimum top diameter of 4.0 inches outside bark or to the point where the main stem or fork breaks into limbs.

Water—Streams, sloughs, estuaries, and canals more than 120 feet wide, and lakes, reservoirs, and ponds more than 1 acre in size at mean high water level.

Wilderness—An area of undeveloped land currently included in the Wilderness System, managed so as to preserve its natural conditions and retain its primeval character and influence.

Woodland—Forest land where timber species make up less than 10 percent stocking.

Woodland species—Tree species not usually converted into industrial wood products. Common uses are fuelwood, fenceposts, and Christmas trees.

Woodland species dead volume—Net volume of dead woodland trees and dead net volume portion of live woodland tree species.

Woodland species live volume—Net cubic-foot volume in live woodland tree species.

APPENDIX II: INVENTORY TECHNIQUES AND DATA RELIABILITY

Techniques

The inventory was designed to provide reliable statistics primarily at the State and sample area levels. Procedures were as follows:

1. Initial area estimates were based on the classification of 693,000 sample points systematically placed on the latest aerial photographs available. The sample points were summarized and grouped into strata for subsequent field sampling. The photo points, adjusted to meet known land areas, were used to compute area expansion factors for the field stratum means.

2. Land classification and estimates of timber characteristics and volume were based on observations and measurements recorded at 2,772 ground sample locations of which 636 were forested. Sample trees were selected using a 10-point cluster, which includes fixed plots (1/300-acre) for trees less than 5 inches d.b.h. and variable plots (40-BAF) for trees 5 inches d.b.h. or larger.

3. Kemp's equations were used to compute volume and defect.

4. All photo and field data were sent to the Intermountain Research Station, Ogden, UT, for editing and were punched onto cards and stored for machine computing, sorting, and tabulation. Final estimates were based on statistical summaries of the data.

Data Reliability

Individual cells within tables should be used with caution. Some are based on small sample sizes and so result in high sampling errors. The standard error percentages shown in appendix tables 65 and 66 were calculated at the 67 percent confidence level.

APPENDIX III: FOREST SURVEY TABLES

Table 9.--Area of forest land in Idaho by forest type, ownership class and land class, 1981

Forest type	Ownership class and land class						
	National Forest			Other public		Forest industry	
	Deferred	Reserved	Nonreserved	Reserved	Nonreserved	Reserved	Nonreserved
	Thousand acres						
Douglas-fir	373.9	847.1	4,357.4	0.7	525.0	--	250.5
Hemlock	9.3	27.1	388.3	--	60.5	--	64.9
Ponderosa pine	118.0	168.8	1,156.5	0.5	228.4	--	103.7
Western white pine	1.7	6.7	131.0	--	84.1	--	5.2
Lodgepole pine	203.7	685.0	2,644.2	33.3	128.6	--	56.3
Western larch	20.8	45.2	528.5	--	46.1	--	36.0
Western redcedar	9.6	20.3	252.1	--	104.6	--	188.5
Grand fir	60.6	116.3	922.3	--	218.1	--	364.6
Engelmann spruce-fir	128.5	542.7	2,247.4	--	102.4	--	100.4
Aspen	5.7	17.7	136.6	--	128.0	--	([1])
Cottonwood	3.5	14.6	43.2	--	9.2	--	8.0
Total timberland	935.3	2,491.5	12,807.5	34.5	1,635.0	--	1,178.1
Pinyon-juniper	--	--	--	--	42.1	--	--
Juniper	--	--	--	--	306.3	--	0.2
Western juniper	--	--	--	--	132.9	--	--
Oak	--	1.0	--	--	([1])	--	--
Mountain brush	--	--	--	--	22.8	--	0.4
Riparian	--	--	--	--	12.4	--	0.8
Other hardwoods	--	--	--	--	43.3	--	8.8
Total woodland	--	1.0	--	--	559.8	--	10.2
Total all types	935.3	2,492.5	12,807.5	34.5	2,194.8	--	1,188.3

(con.)

Table 9 (con.)

Forest type	Ownership class and land class					
	Nonindustrial private		All owners			
	Reserved	Nonreserved	Deferred	Reserved	Nonreserved	Total
	Thousand acres					
Douglas-fir	--	712.8	373.9	847.8	5,845.7	7,067.4
Hemlock	--	27.9	9.3	27.1	541.6	578.0
Ponderosa pine	--	417.8	118.0	169.3	1,906.4	2,193.7
Western white pine	--	18.7	1.7	6.7	239.0	247.4
Lodgepole pine	--	191.0	203.7	718.3	3,020.1	3,942.1
Western larch	--	46.0	20.8	45.2	656.6	722.6
Western redcedar	--	70.9	9.6	20.3	616.1	646.0
Grand fir	--	262.1	60.6	116.3	1,767.1	1,944.0
Engelmann spruce-fir	--	48.6	128.5	542.7	2,498.8	3,170.0
Aspen	--	182.6	5.7	17.7	447.2	470.6
Cottonwood	--	61.6	3.5	14.6	122.0	140.1
Total timberland	--	2,040.0	935.3	2,526.0	17,660.6	21,121.9
Pinyon-juniper	--	38.6	--	--	80.7	80.7
Juniper	--	62.2	--	--	368.7	368.7
Western juniper	--	28.5	--	--	161.4	161.4
Oak	--	--	--	1.0	([1])	1.0
Mountain brush	--	19.1	--	--	42.3	42.3
Riparian	--	56.7	--	--	69.9	69.9
Other hardwoods	--	43.3	--	--	95.4	95.4
Total woodland	--	248.4	--	1.0	818.4	819.4
Total all types	--	2,288.4	935.3	2,527.0	18,479.0	21,941.3

[1]Less than 50 acres.

Table 10.--Area of timberland in Idaho by forest type, stand-size class, and productivity class, 1981

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	Thousand acres						
Douglas-fir:							
Sawtimber	128.3	425.6	717.4	1,137.8	990.5	1.0	3,400.6
Poletimber	24.2	29.7	111.3	116.7	83.3	--	365.2
Sapling and seedling	22.7	42.0	151.8	73.3	87.1	--	376.9
Nonstocked	0.2	3.7	70.7	79.2	144.4	9.3	307.5
Total	175.4	501.0	1,051.2	1,407.0	1,305.3	10.3	4,450.2
Hemlock:							
Sawtimber	0.8	78.5	168.9	73.5	15.6	--	337.3
Poletimber	--	42.1	20.3	20.8	5.3	--	88.5
Sapling and seedling	--	38.1	14.8	32.4	0.4	--	85.7
Nonstocked	--	0.8	2.5	7.4	--	--	10.7
Total	0.8	159.5	206.5	134.1	21.3	--	522.2
Ponderosa pine:							
Sawtimber	22.2	118.6	313.4	461.3	310.9	--	1,226.4
Poletimber	5.1	0.3	9.9	35.8	11.5	--	62.6
Sapling and seedling	0.9	12.3	15.8	46.4	27.6	--	103.0
Nonstocked	--	2.3	62.0	70.1	75.0	--	209.4
Total	28.2	133.5	401.1	613.6	425.0	--	1,601.4
Western white pine:							
Sawtimber	44.7	65.6	41.2	7.3	0.8	--	159.6
Poletimber	2.7	14.3	16.0	14.4	6.6	--	54.0
Sapling and seedling	0.5	0.9	3.2	1.8	0.2	--	6.6
Nonstocked	--	5.5	1.6	2.3	1.6	--	11.0
Total	47.9	86.3	62.0	25.8	9.2	--	231.2
Lodgepole pine:							
Sawtimber	23.0	66.5	166.4	279.7	463.6	--	999.2
Poletimber	17.3	61.9	130.3	154.7	518.2	--	882.4
Sapling and seedling	0.1	3.6	18.9	95.4	176.2	--	294.2
Nonstocked	--	0.4	11.1	17.4	53.6	--	82.5
Total	40.4	132.4	326.7	547.2	1,211.6	--	2,258.3
Western larch:							
Sawtimber	8.1	58.2	133.8	47.0	14.3	--	261.4
Poletimber	1.3	23.3	84.7	73.9	--	--	183.2
Sapling and seedling	0.5	24.2	54.9	73.8	7.4	--	160.8
Nonstocked	--	0.2	0.5	5.8	2.8	--	9.3
Total	9.9	105.9	273.9	200.5	24.5	--	614.7
Western redcedar:							
Sawtimber	97.0	160.1	175.6	42.2	2.0	--	476.9
Poletimber	0.3	9.2	10.1	3.7	--	--	23.3
Sapling and seedling	--	41.2	26.4	18.0	--	--	85.6
Nonstocked	--	5.3	13.2	4.0	2.2	--	24.7
Total	97.3	215.8	225.3	67.9	4.2	--	610.5

(con.)

Table 10 (con.)

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - - - - - Thousand acres - - - - - - - - - - - - - - - -						
Grand fir:							
Sawtimber	128.6	359.8	479.7	287.2	15.2	--	1,270.5
Poletimber	5.0	85.2	36.5	24.6	0.5	--	151.8
Sapling and seedling	2.0	89.8	79.9	56.9	6.3	--	234.9
Nonstocked	--	14.5	6.9	8.9	2.4	--	32.7
Total	135.6	549.3	603.0	377.6	24.4	--	1,689.9
Engelmann spruce-fir:							
Sawtimber	1.6	82.0	356.8	422.9	315.8	0.9	1,180.0
Poletimber	--	16.0	53.6	73.7	46.6	--	189.9
Sapling and seedling	5.0	8.1	50.0	37.7	36.7	0.8	138.3
Nonstocked	--	0.4	4.0	36.4	13.8	0.8	55.4
Total	6.6	106.5	464.4	570.7	412.9	2.5	1,563.6
Aspen:							
Sawtimber	0.2	--	6.4	18.5	19.5	--	44.6
Poletimber	--	1.0	5.9	34.2	101.1	4.9	147.1
Sapling and seedling	--	6.0	7.2	35.0	112.6	21.8	182.6
Nonstocked	0.8	0.2	--	0.7	0.7	4.9	7.3
Total	1.0	7.2	19.5	88.4	233.9	31.6	381.6
Cottonwood:							
Sawtimber	--	7.9	6.9	28.6	8.0	--	51.4
Poletimber	--	--	--	--	8.8	--	8.8
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	16.3	6.2	--	22.5
Total	--	7.9	6.9	44.9	23.0	--	82.7
All types:							
Sawtimber	454.5	1,422.8	2,566.5	2,806.0	2,156.2	1.9	9,407.9
Poletimber	55.9	283.0	478.6	552.5	781.9	4.9	2,156.8
Sapling and seedling	31.7	266.2	422.9	470.7	454.5	22.6	1,668.6
Nonstocked	1.0	33.3	172.5	248.5	302.7	15.0	773.0
Total	543.1	2,005.3	3,640.5	4,077.7	3,695.3	44.4	14,006.3[1]

[1]Does not include 3,654.3 thousand acres of productivity class 0-19 for National Forest lands as this information was not available by stand-size class for this report.

Table 11.--Area of National Forest timberland in Idaho by forest type, stand-size class, and productivity class, 1981

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - - - Thousand acres - - - - - - - - - - - - - -						
Douglas-fir:							
Sawtimber	50.3	162.1	288.2	897.9	948.0	--	2,346.5
Poletimber	10.2	17.5	69.2	69.7	75.1	--	241.7
Sapling and seedling	17.4	24.4	99.1	27.4	80.8	--	249.1
Nonstocked	--	0.4	45.2	16.1	62.9	--	124.6
Total	77.9	204.4	501.7	1,011.1	1,166.8	1,395.5	2,961.9[1]
Hemlock:							
Sawtimber	--	47.4	120.0	32.3	15.0	--	214.7
Poletimber	--	41.8	4.9	20.1	5.3	--	72.1
Sapling and seedling	--	37.4	7.1	31.5	--	--	76.0
Nonstocked	--	0.8	--	5.3	--	--	6.1
Total	--	127.4	132.0	89.2	20.3	19.4	368.9[1]
Ponderosa pine:							
Sawtimber	1.7	19.7	107.1	309.6	298.9	--	737.0
Poletimber	--	0.1	1.0	6.8	6.6	--	14.5
Sapling and seedling	--	--	0.1	22.6	26.2	--	48.9
Nonstocked	--	--	--	8.5	42.6	--	51.1
Total	1.7	19.8	108.2	347.5	374.3	305.0	851.5[1]
Western white pine:							
Sawtimber	25.4	34.5	16.7	3.7	--	--	80.3
Poletimber	--	8.3	14.0	12.1	6.6	--	41.0
Sapling and seedling	--	--	1.9	--	--	--	1.9
Nonstocked	--	--	--	--	--	--	--
Total	25.4	42.8	32.6	15.8	6.6	7.8	123.2[1]
Lodgepole pine:							
Sawtimber	9.3	56.3	89.9	217.8	447.1	--	820.4
Poletimber	2.0	53.1	100.9	106.1	502.6	--	764.7
Sapling and seedling	--	2.5	6.4	60.7	171.8	--	241.4
Nonstocked	--	--	--	3.8	52.1	--	55.9
Total	11.3	111.9	197.2	388.4	1,173.6	761.8	1,882.4[1]
Western larch:							
Sawtimber	7.9	35.6	92.5	28.6	14.3	--	178.9
Poletimber	0.1	9.6	65.3	68.4	--	--	143.4
Sapling and seedling	--	24.2	52.7	73.5	7.4	--	157.8
Nonstocked	--	0.2	0.5	5.8	--	--	6.5
Total	8.0	69.6	211.0	176.3	21.7	41.9	486.6[1]
Western redcedar:							
Sawtimber	61.3	108.7	52.5	5.9	--	--	228.4
Poletimber	--	2.7	1.3	0.9	--	--	4.9
Sapling and seedling	--	2.0	8.4	--	--	--	10.4
Nonstocked	--	--	2.8	--	--	--	2.8
Total	61.3	113.4	65.0	6.8	--	5.6	246.5[1]

(con.)

Table 11 (con.)

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - - - - Thousand acres - - - - - - - - - - - - - - -						
Grand fir:							
Sawtimber	96.2	167.7	162.9	149.2	14.1	--	590.1
Poletimber	--	84.2	24.0	15.0	0.1	--	123.3
Sapling and seedling	1.7	89.4	23.4	10.3	6.3	--	131.1
Nonstocked	--	--	--	--	0.6	--	0.6
Total	97.9	341.3	210.3	174.5	21.1	77.2	845.1[1]
Engelmann spruce-fir:							
Sawtimber	1.6	63.9	275.8	364.9	304.7	--	1,010.9
Poletimber	--	16.0	43.8	59.5	43.0	--	162.3
Sapling and seedling	5.0	8.1	28.3	25.0	33.1	--	99.5
Nonstocked	--	--	3.1	23.9	12.5	--	39.5
Total	6.6	88.0	351.0	473.3	393.3	935.2	1,312.2[1]
Aspen:							
Sawtimber	--	--	--	6.3	16.7	--	23.0
Poletimber	--	--	--	3.9	21.0	--	24.9
Sapling and seedling	--	--	--	7.7	15.4	--	23.1
Nonstocked	--	--	--	--	--	--	--
Total	--	--	--	17.9	53.1	65.6	71.0[1]
Cottonwood:							
Sawtimber	--	--	2.0	1.9	--	--	3.9
Poletimber	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--
Total	--	--	2.0	1.9	--	39.3	3.9[1]
All types:							
Sawtimber	253.7	695.9	1,207.6	2,018.1	2,058.8	--	6,234.1
Poletimber	12.3	233.3	324.4	362.5	660.3	--	1,592.8
Sapling and seedling	24.1	188.0	227.4	258.7	341.0	--	1,039.2
Nonstocked	--	1.4	51.6	63.4	170.7	--	287.1
Total	290.1	1,118.6	1,811.0	2,702.7	3,230.8	3,654.3	9,153.2[1]

[1]Does not include the 0-19 productivity class totals as this information was not available by stand-size class for this report.

Table 12.--Area of other publicly owned timberland in Idaho by forest type, stand-size class, and productivity class, 1981

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	Thousand acres						
Douglas-fir:							
Sawtimber	10.1	56.9	122.1	114.0	35.7	1.0	339.8
Poletimber	0.5	7.4	17.4	14.0	8.2	--	47.5
Sapling and seedling	0.5	1.2	5.5	14.9	6.3	--	28.4
Nonstocked	0.2	--	12.4	17.5	76.7	2.5	109.3
Total	11.3	65.5	157.4	160.4	126.9	3.5	525.0
Hemlock:							
Sawtimber	0.8	10.9	20.6	17.4	0.6	--	50.3
Poletimber	--	0.3	1.2	0.7	--	--	2.2
Sapling and seedling	--	0.7	1.4	0.9	0.4	--	3.4
Nonstocked	--	--	2.5	2.1	--	--	4.6
Total	0.8	11.9	25.7	21.1	1.0	--	60.5
Ponderosa pine:							
Sawtimber	7.7	22.3	41.3	58.1	12.0	--	141.4
Poletimber	0.4	0.2	2.1	9.9	4.9	--	17.5
Sapling and seedling	0.9	0.3	3.2	5.9	1.4	--	11.7
Nonstocked	--	2.3	21.2	20.1	14.2	--	57.8
Total	9.0	25.1	67.8	94.0	32.5	--	228.4
Western white pine:							
Sawtimber	5.4	31.1	24.5	3.6	0.8	--	65.4
Poletimber	2.7	1.2	2.0	2.3	--	--	8.2
Sapling and seedling	0.5	0.9	1.3	1.8	0.2	--	4.7
Nonstocked	--	0.3	1.6	2.3	1.6	--	5.8
Total	8.6	33.5	29.4	10.0	2.6	--	84.1
Lodgepole pine:							
Sawtimber	2.6	3.9	14.4	26.6	11.6	--	59.1
Poletimber	1.4	2.3	8.3	19.6	15.6	--	47.2
Sapling and seedling	0.1	1.1	2.8	3.6	4.4	--	12.0
Nonstocked	--	0.4	5.2	3.2	1.5	--	10.3
Total	4.1	7.7	30.7	53.0	33.1	--	128.6
Western larch:							
Sawtimber	0.2	2.3	12.1	6.1	--	--	20.7
Poletimber	1.2	4.6	8.3	5.5	--	--	19.6
Sapling and seedling	0.5	--	2.2	0.3	--	--	3.0
Nonstocked	--	--	--	--	2.8	--	2.8
Total	1.9	6.9	22.6	11.9	2.8	--	46.1
Western redcedar:							
Sawtimber	6.4	21.6	31.9	18.4	2.0	--	80.3
Poletimber	0.3	--	2.0	2.8	--	--	5.1
Sapling and seedling	--	0.1	4.1	3.6	--	--	7.8
Nonstocked	--	--	5.2	4.0	2.2	--	11.4
Total	6.7	21.7	43.2	28.8	4.2	--	104.6

(con.)

Table 12 (con.)

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	Thousand acres						
Grand fir:							
Sawtimber	7.4	36.8	79.9	59.4	1.1	--	184.6
Poletimber	0.2	1.0	2.8	3.0	0.4	--	7.4
Sapling and seedling	0.3	0.4	3.0	4.1	--	--	7.8
Nonstocked	--	0.7	6.9	8.9	1.8	--	18.3
Total	7.9	38.9	92.6	75.4	3.3	--	218.1
Engelmann spruce-fir:							
Sawtimber	--	7.9	29.9	27.2	11.1	0.9	77.0
Poletimber	--	--	2.8	4.6	3.6	--	11.0
Sapling and seedling	--	--	2.1	1.6	3.6	0.8	8.1
Nonstocked	--	0.4	0.9	2.9	1.3	0.8	6.3
Total	--	8.3	35.7	36.3	19.6	2.5	102.4
Aspen:							
Sawtimber	0.2	--	6.4	12.2	2.8	--	21.6
Poletimber	--	1.0	5.9	15.8	31.3	0.1	54.1
Sapling and seedling	--	0.1	1.1	20.5	26.7	1.4	49.8
Nonstocked	0.8	0.2	--	0.7	0.7	0.1	2.5
Total	1.0	1.3	13.4	49.2	61.5	1.6	128.0
Cottonwood:							
Sawtimber	--	--	0.1	3.2	0.2	--	3.5
Poletimber	--	--	--	--	2.8	--	2.8
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	2.8	0.1	--	2.9
Total	--	--	0.1	6.0	3.1	--	9.2
All types:							
Sawtimber	40.8	193.7	383.2	346.2	77.9	1.9	1,043.7
Poletimber	6.7	18.0	52.8	78.2	66.8	0.1	222.6
Sapling and seedling	2.8	4.8	26.7	57.2	43.0	2.2	136.7
Nonstocked	1.0	4.3	55.9	64.5	102.9	3.4	232.0
Total	51.3	220.8	518.6	546.1	290.6	7.6	1,635.0

Table 13.--Area of forest industry owned timberland in Idaho by forest type, stand-size class, and productivity class, 1981

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - - - Thousand acres - - - - - - - - - - - - - -						
Douglas-fir:							
Sawtimber	13.4	90.4	45.4	32.1	--	--	181.3
Poletimber	13.5	--	0.8	7.9	--	--	22.2
Sapling and seedling	--	5.2	13.7	12.3	--	--	31.2
Nonstocked	--	0.5	7.0	8.3	--	--	15.8
Total	26.9	96.1	66.9	60.6	--	--	250.5
Hemlock:							
Sawtimber	--	20.2	22.0	14.8	--	--	57.0
Poletimber	--	--	7.9	--	--	--	7.9
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--
Total	--	20.2	29.9	14.8	--	--	64.9
Ponderosa pine:							
Sawtimber	7.9	1.6	33.1	19.5	--	--	62.1
Poletimber	--	--	--	12.8	--	--	12.8
Sapling and seedling	--	--	2.1	12.4	--	--	14.5
Nonstocked	--	--	2.0	6.3	6.0	--	14.3
Total	7.9	1.6	37.2	51.0	6.0	--	103.7
Western white pine:							
Sawtimber	--	--	--	--	--	--	--
Poletimber	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	5.2	--	--	--	--	5.2
Total	--	5.2	--	--	--	--	5.2
Lodgepole pine:							
Sawtimber	--	--	27.6	14.2	--	--	41.8
Poletimber	--	6.5	6.6	1.4	--	--	14.5
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--
Total	--	6.5	34.2	15.6	--	--	56.3
Western larch:							
Sawtimber	--	14.0	9.7	12.3	--	--	36.0
Poletimber	--	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--
Total	--	14.0	9.7	12.3	--	--	36.0
Western redcedar:							
Sawtimber	7.0	20.7	56.5	17.9	--	--	102.1
Poletimber	--	6.5	6.8	--	--	--	13.3
Sapling and seedling	--	34.3	13.9	14.4	--	--	62.6
Nonstocked	--	5.3	5.2	--	--	--	10.5
Total	7.0	66.8	82.4	32.3	--	--	188.5

(con.)

Table 13 (con.)

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - - - - - Thousand acres - - - - - - - - - - - - - - - -						
Grand fir:							
Sawtimber	6.5	81.1	175.2	33.6	--	--	296.4
Poletimber	--	--	--	6.6	--	--	6.6
Sapling and seedling	--	--	31.7	16.1	--	--	47.8
Nonstocked	--	13.8	--	--	--	--	13.8
Total	6.5	94.9	206.9	56.3	--	--	364.6
Engelmann spruce-fir:							
Sawtimber	--	10.2	45.2	7.3	--	--	62.7
Poletimber	--	--	7.0	(1)	--	--	7.0
Sapling and seedling	--	--	19.6	11.1	--	--	30.7
Nonstocked	--	--	--	(1)	--	--	(1)
Total	--	10.2	71.8	18.4	--	--	100.4
Aspen:							
Sawtimber	--	--	--	--	--	--	--
Poletimber	--	--	--	--	(1)	--	(1)
Sapling and seedling	--	--	--	--	--	(1)	(1)
Nonstocked	--	--	--	--	--	--	--
Total	--	--	--	--	(1)	(1)	(1)
Cottonwood:							
Sawtimber	--	7.9	--	--	--	--	7.9
Poletimber	--	--	--	--	(1)	--	(1)
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	0.1	--	--	0.1
Total	--	7.9	--	0.1	(1)	--	8.0
All types:							
Sawtimber	34.8	246.1	414.7	151.7	--	--	847.3
Poletimber	13.5	13.0	29.1	28.7	(1)	--	84.3
Sapling and seedling	--	39.5	81.0	66.3	--	(1)	186.8
Nonstocked	--	24.8	14.2	14.7	6.0	--	59.7
Total	48.3	323.4	539.0	261.4	6.0	(1)	1,178.1

[1]Less than 50 acres.

Table 14.--Area of nonindustrial privately owned timberland in Idaho by forest type, stand-size class, and productivity class, 1981

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	Thousand acres						
Douglas-fir:							
Sawtimber	54.5	116.2	261.7	93.8	6.8	--	533.0
Poletimber	--	4.8	23.9	25.1	--	--	53.8
Sapling and seedling	4.8	11.2	33.5	18.7	--	--	68.2
Nonstocked	--	2.8	6.1	37.3	4.8	6.8	57.8
Total	59.3	135.0	325.2	174.9	11.6	6.8	712.8
Hemlock:							
Sawtimber	--	--	6.3	9.0	--	--	15.3
Poletimber	--	--	6.3	--	--	--	6.3
Sapling and seedling	--	--	6.3	--	--	--	6.3
Nonstocked	--	--	--	--	--	--	--
Total	--	--	18.9	9.0	--	--	27.9
Ponderosa pine:							
Sawtimber	4.9	75.0	131.9	74.1	--	--	285.9
Poletimber	4.7	--	6.8	6.3	--	--	17.8
Sapling and seedling	--	12.0	10.4	5.5	--	--	27.9
Nonstocked	--	--	38.8	35.2	12.2	--	86.2
Total	9.6	87.0	187.9	121.1	12.2	--	417.8
Western white pine:							
Sawtimber	13.9	--	--	--	--	--	13.9
Poletimber	--	4.8	--	--	--	--	4.8
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--
Total	13.9	4.8	--	--	--	--	18.7
Lodgepole pine:							
Sawtimber	11.1	6.3	34.5	21.1	4.9	--	77.9
Poletimber	13.9	--	14.5	27.6	--	--	56.0
Sapling and seedling	--	--	9.7	31.1	--	--	40.8
Nonstocked	--	--	5.9	10.4	--	--	16.3
Total	25.0	6.3	64.6	90.2	4.9	--	191.0
Western larch:							
Sawtimber	--	6.3	19.5	--	--	--	25.8
Poletimber	--	9.1	11.1	--	--	--	20.2
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--	--
Total	--	15.4	30.6	--	--	--	46.0
Western redcedar:							
Sawtimber	22.3	9.1	34.7	--	--	--	66.1
Poletimber	--	--	--	--	--	--	--
Sapling and seedling	--	4.8	--	--	--	--	4.8
Nonstocked	--	--	--	--	--	--	--
Total	22.3	13.9	34.7	--	--	--	70.9

(con.)

Table 14 (con.)

Forest type and stand-size class	Productivity class						Total acres
	165+	120-164	85-119	50-84	20-49	0-19	
	Thousand acres						
Grand fir:							
Sawtimber	18.5	74.2	61.7	45.0	--	--	199.4
Poletimber	4.8	--	9.7	--	--	--	14.5
Sapling and seedling	--	--	21.8	26.4	--	--	48.2
Nonstocked	--	--	--	--	--	--	--
Total	23.3	74.2	93.2	71.4	--	--	262.1
Engelmann spruce-fir:							
Sawtimber	--	--	5.9	23.5	--	--	29.4
Poletimber	--	--	--	9.6	--	--	9.6
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	9.6	--	--	9.6
Total	--	--	5.9	42.7	--	--	48.6
Aspen:							
Sawtimber	--	--	--	--	--	--	--
Poletimber	--	--	--	14.5	48.8	4.8	68.1
Sapling and seedling	--	5.9	6.1	6.8	70.5	20.4	109.7
Nonstocked	--	--	--	--	--	4.8	4.8
Total	--	5.9	6.1	21.3	119.3	30.0	182.6
Cottonwood:							
Sawtimber	--	--	4.8	23.5	7.8	--	36.1
Poletimber	--	--	--	--	6.0	--	6.0
Sapling and seedling	--	--	--	--	--	--	--
Nonstocked	--	--	--	13.4	6.1	--	19.5
Total	--	--	4.8	36.9	19.9	--	61.6
All types:							
Sawtimber	125.2	287.1	561.0	290.0	19.5	--	1,282.8
Poletimber	23.4	18.7	72.3	83.1	54.8	4.8	257.1
Sapling and seedling	4.8	33.9	87.8	88.5	70.5	20.4	305.9
Nonstocked	--	2.8	50.8	105.9	23.1	11.6	194.2
Total	153.4	342.5	771.9	567.5	167.9	36.8	2,040.0

Table 15.--Area of timberland in Idaho by stand-size class and ownership class, 1981

Stand-size class	Ownership class				Total
	National Forest	Other public	Forest industry	Nonindustrial private	
	- - - - - - - - - - - Thousand acres - - - - - - - - - - -				
Sawtimber stands	6,234.1	1,043.7	847.3	1,282.8	9,407.9
Poletimber stands	1,592.8	222.6	84.3	257.1	2,156.8
Sapling and seedling stands	1,039.2	136.7	186.8	305.9	1,668.6
Nonstocked areas	287.1	232.0	59.7	194.2	773.0
Total	9,153.2[1]	1,635.0	1,178.1	2,040.0	14,006.3

[1]Does not include 3,654.3 thousand acres of productivity class 0-19 as this information was not available by stand-size class for this report.

Table 16.--Number of growing-stock trees on timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)															
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand trees															
Douglas-fir	210,079	166,007	139,139	97,840	76,528	53,868	43,454	26,356	17,677	12,053	7,768	5,434	3,519	2,201	4,500	866,423
Ponderosa pine	21,495	24,759	23,995	17,208	11,028	11,035	7,306	5,864	3,376	2,950	2,308	1,857	1,438	1,114	3,761	139,494
Western white pine	12,372	6,402	7,884	5,831	5,166	4,031	3,233	2,047	2,007	1,161	867	750	496	268	542	53,057
Lodgepole pine	193,700	227,729	194,282	141,357	74,319	32,833	11,884	4,380	1,455	488	224	47	6	8	5	882,717
Whitebark pine	15,787	9,646	7,246	4,707	2,602	1,383	975	732	267	105	75	33	18	13	20	43,609
Limber pine	1,078	85	64	249	128	21	62	3	2	6	3	--	1	2	--	1,704
Western larch	14,776	25,816	32,476	22,315	14,123	7,975	5,441	2,948	1,853	1,230	838	503	326	219	491	131,330
Grand fir	202,178	122,588	78,338	47,092	33,037	19,729	13,640	8,623	6,000	3,785	2,188	1,777	1,358	938	2,054	543,325
Subalpine fir	202,388	128,787	79,092	48,155	29,455	17,718	10,235	6,008	3,258	1,847	1,164	554	375	120	138	529,294
White fir	2,333	1,491	668	529	263	277	216	154	130	77	50	45	36	21	147	6,437
Engelmann spruce	46,595	26,115	19,343	16,144	11,735	8,609	6,906	4,786	3,332	2,642	2,076	1,418	812	524	926	151,963
Western hemlock	87,356	40,198	28,902	14,972	10,752	6,660	5,430	3,211	2,352	1,398	892	669	347	284	431	203,854
Western redcedar	152,713	54,994	30,615	19,065	13,698	8,794	6,401	4,274	3,101	2,395	1,719	1,072	791	718	1,959	302,309
Total softwoods	1,162,850	834,617	642,044	435,464	282,834	172,933	115,183	69,386	44,810	30,137	20,172	14,159	9,523	6,430	14,974	3,855,516
Aspen	64,249	40,703	39,610	15,331	4,755	2,078	518	177	79	40	19	2	--	1	--	167,562
Cottonwood	3,670	1,503	2,441	547	837	810	573	432	375	153	179	146	52	29	127	11,874
Total hardwoods	67,919	42,206	42,051	15,878	5,592	2,888	1,091	609	454	193	198	148	52	30	127	179,436
All species	1,230,769	876,823	684,095	451,342	288,426	175,821	116,274	69,995	45,264	30,330	20,370	14,307	9,575	6,460	15,101	4,034,952

Table 17.--Net volume of timber on timberland in Idaho by class of timber, and softwoods and hardwoods, 1981

Class of timber	Softwoods	Hardwoods	All classes
	Million cubic feet		
Sawtimber trees:			
Saw-log portion	23,066.6	125.7	23,192.3
Upper-stem portion	2,400.6	35.5	2,436.1
Total	25,467.2	161.2	25,628.4
Poletimber trees	4,719.0	239.1	4,958.1
All growing stock trees	30,186.2	400.3	30,586.5
Sound cull trees	167.4	11.2	178.6
Rotten cull trees	397.0	24.8	421.8
Salvable dead trees	1,968.2	29.0	1,997.2
All timber	32,718.8	465.3	33,184.1

Table 18.--Net volume of growing stock on timberland in Idaho by ownership class and species, 1981

Species	Ownership class				
	National Forest	Other public	Forest industry	Nonindustrial private	Total
	Million cubic feet				
Douglas-fir	5,936.0	998.7	467.3	1,145.3	8,547.3
Ponderosa pine	1,983.5	300.5	142.6	501.0	2,927.6
Western white pine	902.8	236.7	67.4	116.4	1,323.3
Lodgepole pine	3,292.9	263.8	136.5	386.1	4,079.3
Whitebark pine	140.3	7.0	--	--	147.3
Limber pine	--	2.1	--	4.0	6.1
Western larch	778.8	221.1	191.2	231.7	1,422.8
Grand fir	2,588.4	587.0	665.8	400.6	4,241.8
Subalpine fir	1,800.3	109.4	62.4	39.9	2,012.0
White fir	95.1	--	--	--	95.1
Engelmann spruce	1,858.2	107.8	72.3	28.6	2,066.9
Western hemlock	1,077.8	136.5	129.4	59.6	1,403.3
Western redcedar	1,134.9	285.3	332.0	161.2	1,913.4
Total softwoods	21,589.0	3,255.9	2,266.9	3,074.4	30,186.2
Aspen	50.9	99.6	4.2	121.7	276.4
Cottonwood	16.0	9.3	13.4	85.2	123.9
Total hardwoods	66.9	108.9	17.6	206.9	400.3
All species	21,655.9	3,364.8	2,284.5	3,281.3	30,586.5

Table 19.--Net volume of sawtimber (International ¼-inch rule) on timberland in Idaho by ownership class and species, 1981

Species	Ownership class				
	National Forest	Other public	Forest industry	Nonindustrial private	Total
	- - - - Million board feet, International ¼-inch rule - - - - -				
Douglas-fir	28,062.4	4,504.7	2,127.5	5,029.5	39,724.1
Ponderosa pine	11,122.6	1,652.8	731.7	2,512.9	16,020.0
Western white pine	4,059.5	1,366.5	357.6	606.1	6,389.7
Lodgepole pine	9,414.1	722.4	395.4	1,088.1	11,620.0
Whitebark pine	562.2	22.3	--	--	584.5
Limber pine	--	6.6	--	11.3	17.9
Western larch	3,401.4	906.1	954.1	961.8	6,223.4
Grand fir	12,670.6	3,017.0	2,707.7	1,602.1	19,997.4
Subalpine fir	6,804.5	389.2	227.8	115.3	7,536.8
White fir	485.3	--	--	--	485.3
Engelmann spruce	9,131.6	580.6	323.2	134.8	10,170.2
Western hemlock	4,367.6	659.6	530.1	215.3	5,772.6
Western redcedar	5,347.9	1,331.5	1,347.3	527.1	8,553.8
Total softwoods	95,429.7	15,159.3	9,702.4	12,804.3	133,095.7
Aspen	78.5	98.7	8.1	89.1	274.4
Cottonwood	26.6	32.4	62.2	384.3	505.5
Total hardwoods	105.1	131.1	70.3	473.4	779.9
All species	95,534.8	15,290.4	9,772.7	13,277.7	133,875.6

Table 20.--Net volume of sawtimber (Scribner rule) on timberland in Idaho by ownership class and species, 1981

Species	Ownership class				
	National Forest	Other public	Forest industry	Nonindustrial private	Total
	- - - - - - - Million board feet, Scribner rule - - - - - - - -				
Douglas-fir	24,975.5	3,814.5	1,815.5	4,234.4	34,839.9
Ponderosa pine	9,899.1	1,401.1	610.8	2,069.5	13,980.5
Western white pine	3,613.1	1,197.3	314.5	526.3	5,651.2
Lodgepole pine	8,378.7	609.9	333.3	916.1	10,238.0
Whitebark pine	500.4	18.2	--	--	518.6
Limber pine	--	5.5	--	9.8	15.3
Western larch	3,027.2	746.2	785.0	763.6	5,322.0
Grand fir	11,276.9	2,625.7	2,328.4	1,369.4	17,600.4
Subalpine fir	6,056.1	327.9	191.8	95.1	6,670.9
White fir	432.0	--	--	--	432.0
Engelmann spruce	8,127.2	506.7	279.8	117.1	9,030.8
Western hemlock	3,887.2	572.8	456.2	180.1	5,096.3
Western redcedar	4,759.7	1,105.2	1,103.4	418.8	7,387.1
Total softwoods	84,933.1	12,931.0	8,218.7	10,700.2	116,783.0
Aspen	69.8	81.3	7.1	74.7	232.9
Cottonwood	23.8	28.4	55.1	333.5	440.8
Total hardwoods	93.6	109.7	62.2	408.2	673.7
All species	85,026.7	13,040.7	8,280.9	11,108.4	117,456.7

Table 21.--Net volume of growing stock on timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million cubic feet													
Douglas-fir	318.5	548.8	771.7	892.3	1,067.6	909.5	806.3	707.2	586.9	486.3	386.6	280.5	785.1	8,547.3
Ponderosa pine	30.2	70.0	93.8	168.6	177.4	198.8	167.1	187.5	195.0	202.5	204.8	198.0	1,033.9	2,927.6
Western white pine	26.4	44.5	79.3	101.3	119.6	116.3	154.7	118.8	108.3	114.9	89.2	61.3	188.7	1,323.3
Lodgepole pine	608.5	1,076.9	1,010.4	700.4	361.2	184.2	78.5	32.7	18.6	4.8	0.9	1.1	1.1	4,079.3
Whitebark pine	9.5	20.2	22.4	20.2	21.4	24.2	10.3	5.6	4.8	2.6	1.8	1.3	3.0	147.3
Limber pine	0.2	2.1	1.4	0.2	1.6	0.1	0.1	0.2	0.1	--	([1])	0.1	--	6.1
Western larch	90.6	148.3	177.2	162.3	163.5	125.6	111.3	98.5	80.5	58.8	46.7	36.8	122.7	1,422.8
Grand fir	195.8	318.7	415.0	430.3	446.8	396.7	379.1	307.0	230.9	219.5	203.6	163.2	535.2	4,241.8
Subalpine fir	193.6	282.9	316.2	304.5	254.2	210.0	147.9	109.4	82.9	44.3	35.3	12.7	18.1	2,012.0
White fir	1.6	2.8	3.0	5.8	6.8	6.9	8.2	6.5	5.4	6.0	5.6	4.0	32.5	95.1
Engelmann spruce	48.4	104.1	142.5	174.7	211.1	208.6	198.1	207.7	200.8	161.4	109.5	82.9	217.1	2,066.9
Western hemlock	105.9	255.5	128.4	127.8	153.0	129.3	121.3	91.0	74.0	64.0	40.7	34.8	77.6	1,403.3
Western redcedar	88.8	126.2	156.5	159.2	158.3	140.5	141.4	143.9	118.2	91.8	82.5	84.3	421.8	1,913.4
Total softwoods	1,718.0	3,001.0	3,317.8	3,247.6	3,142.5	2,650.7	2,324.3	2,016.0	1,706.4	1,456.9	1,207.2	961.0	3,436.8	30,186.2
Aspen	92.7	83.3	44.8	30.1	11.7	6.3	3.6	1.9	1.5	0.2	--	0.3	--	276.4
Cottonwood	6.0	3.0	9.3	13.4	12.8	13.5	14.5	6.9	10.1	8.7	3.4	3.3	19.0	123.9
Total hardwoods	98.7	86.3	54.1	43.5	24.5	19.8	18.1	8.8	11.6	8.9	3.4	3.6	19.0	400.3
All species	1,816.7	3,087.3	3,371.9	3,291.1	3,167.0	2,670.5	2,342.4	2,024.8	1,718.0	1,465.8	1,210.6	964.6	3,455.8	30,586.5

[1]Less than 0.05 million cubic feet.

Table 22.--Net volume of sawtimber (International ¼-inch rule) on timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, International ¼-inch rule											
Douglas-fir	2,961.1	4,406.7	5,468.8	4,726.3	4,257.5	3,759.9	3,208.3	2,682.3	2,177.6	1,601.5	4,474.1	39,724.1
Ponderosa pine	317.4	785.0	935.6	1,097.8	947.7	1,094.5	1,147.9	1,176.4	1,183.0	1,156.2	6,178.5	16,020.0
Western white pine	311.1	505.5	613.4	561.6	752.5	590.3	555.3	593.8	477.2	330.0	1,099.0	6,389.7
Lodgepole pine	4,237.2	3,795.1	1,921.5	960.1	401.7	167.7	96.1	24.0	4.7	5.9	6.0	11,620.0
Whitebark pine	93.4	103.3	112.7	125.9	52.9	27.5	24.1	13.0	9.2	7.3	15.2	584.5
Limber pine	3.9	1.2	9.2	0.4	0.3	1.6	0.5	--	0.3	0.5	--	17.9
Western larch	757.8	941.0	920.6	698.5	595.6	516.8	416.6	314.1	247.5	192.0	622.9	6,223.4
Grand fir	1,559.4	2,196.6	2,362.4	2,123.0	2,036.1	1,659.2	1,298.9	1,266.9	1,194.2	1,015.9	3,284.8	19,997.4
Subalpine fir	1,295.8	1,531.3	1,285.0	1,046.7	757.1	564.0	446.1	244.8	196.2	69.4	100.4	7,536.8
White fir	13.6	29.9	35.5	35.6	42.4	33.5	29.5	32.9	31.0	22.0	179.4	485.3
Engelmann spruce	604.6	915.3	1,101.0	1,083.6	1,025.1	1,082.0	1,088.0	914.9	636.3	487.8	1,231.6	10,170.2
Western hemlock	460.9	603.1	766.4	692.1	674.1	523.0	455.7	421.8	276.0	250.9	648.6	5,772.6
Western redcedar	571.6	736.1	746.9	675.4	676.5	688.5	602.2	482.7	451.5	473.9	2,448.5	8,553.8
Total softwoods	13,187.8	16,550.1	16,279.0	13,827.0	12,219.5	10,708.5	9,369.2	8,167.6	6,884.7	5,613.3	20,289.0	133,095.7
Aspen	XXXXXXXX	147.5	57.6	31.6	18.0	9.4	7.4	1.3	--	1.6	--	274.4
Cottonwood	XXXXXXXX	69.0	65.2	66.7	69.3	32.7	46.2	39.0	14.9	15.0	87.5	505.5
Total hardwoods	XXXXXXXX	216.5	122.8	98.3	87.3	42.1	53.6	40.3	14.9	16.6	87.5	779.9
All species	13,187.8	16,766.6	16,401.8	13,925.3	12,306.8	10,750.6	9,422.8	8,207.9	6,899.6	5,629.9	20,376.5	133,875.6

Table 23.--Net volume of sawtimber (Scribner rule) on timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, Scribner rule											
Douglas-fir	2,497.8	3,762.9	4,761.5	4,147.0	3,755.1	3,327.6	2,855.4	2,387.2	1,938.1	1,425.3	3,982.0	34,839.9
Ponderosa pine	235.0	625.3	786.2	936.9	820.9	951.6	1,008.7	1,038.9	1,049.6	1,028.7	5,498.7	13,980.5
Western white pine	267.9	436.7	536.8	497.3	668.5	525.4	493.5	528.5	424.8	293.7	978.1	5,651.2
Lodgepole pine	3,730.0	3,327.6	1,698.7	853.3	357.4	149.3	85.5	21.3	4.2	5.3	5.4	10,238.0
Whitebark pine	82.5	91.3	100.1	111.9	46.9	24.5	21.4	11.6	8.2	6.6	13.6	518.6
Limber pine	3.5	0.9	7.8	0.3	0.3	1.4	0.5	--	0.2	0.4	--	15.3
Western larch	615.3	760.9	774.3	598.6	521.6	456.9	369.6	279.4	220.2	170.9	554.3	5,322.0
Grand fir	1,325.4	1,883.9	2,063.3	1,871.4	1,806.7	1,475.6	1,156.0	1,127.5	1,062.9	904.1	2,923.6	17,600.4
Subalpine fir	1,145.6	1,344.4	1,137.1	928.7	673.0	501.5	397.0	217.9	174.6	61.8	89.3	6,670.9
White fir	12.1	26.6	31.6	31.7	37.7	29.8	26.3	29.3	27.6	19.6	159.7	432.0
Engelmann spruce	533.5	808.1	975.4	961.6	910.8	962.2	968.3	814.3	566.3	434.2	1,096.1	9,030.8
Western hemlock	394.6	519.4	675.8	614.9	599.9	465.5	404.7	375.3	245.7	223.2	577.3	5,096.3
Western redcedar	482.2	613.9	625.1	562.8	575.8	592.2	521.1	423.0	397.8	418.4	2,174.8	7,387.1
Total softwoods	11,325.4	14,201.9	14,173.7	12,116.4	10,774.6	9,463.5	8,308.0	7,254.2	6,120.2	4,992.2	18,052.9	116,783.0
Aspen	XXXXXXXX	121.6	49.9	27.9	16.0	8.3	6.6	1.2	--	1.4	--	232.9
Cottonwood	XXXXXXXX	57.2	55.6	58.0	60.9	28.9	41.0	34.7	13.3	13.4	77.8	440.8
Total hardwoods	XXXXXXXX	178.8	105.5	85.9	76.9	37.2	47.6	35.9	13.3	14.8	77.8	673.7
All species	11,325.4	14,380.7	14,279.2	12,202.3	10,851.5	9,500.7	8,355.6	7,290.1	6,133.5	5,007.0	18,130.7	117,456.7

Table 24.--Net annual growth of growing stock on timberland in Idaho by ownership class and species, 1980

Species	Ownership class				Total
	National Forest	Other public	Forest industry	Nonindustrial private	
	- - - - - - - - - Thousand cubic feet - - - - - - - - - - - - -				
Douglas-fir	97,203	24,094	12,997	37,181	171,475
Ponderosa pine	23,267	7,458	3,929	18,419	53,073
Western white pine	8,522	2,634	-651	2,966	13,471
Lodgepole pine	66,227	6,552	3,050	10,652	86,481
Whitebark pine	1,743	316	--	--	2,059
Limber pine	--	8	--	50	58
Western larch	12,125	5,518	2,714	5,637	25,994
Grand fir	70,416	16,243	24,027	14,988	125,674
Subalpine fir	25,578	3,196	3,232	2,918	34,924
White fir	837	--	--	--	837
Engelmann spruce	28,443	1,820	1,998	523	32,784
Western hemlock	24,577	3,508	4,373	1,838	34,296
Western redcedar	22,225	6,674	14,636	5,980	49,515
Total softwoods	381,163	78,021	70,305	101,152	630,641
Aspen	870	5,375	206	7,577	14,028
Cottonwood	566	254	396	2,212	3,428
Total hardwoods	1,436	5,629	602	9,789	17,456
All species	382,599	83,650	70,907	110,941	648,097

Table 25.--Net annual growth of sawtimber (International ¼-inch rule) on timberland in Idaho by ownership class and species, 1980

Species	Ownership class				Total
	National Forest	Other public	Forest industry	Nonindustrial private	
	- - - - Thousand board feet, International ¼-inch rule- - - -				
Douglas-fir	524,673	126,021	63,832	170,380	884,906
Ponderosa pine	136,885	39,919	20,988	94,924	292,716
Western white pine	51,793	13,035	2,880	21,693	89,401
Lodgepole pine	215,729	20,621	8,579	38,047	282,976
Whitebark pine	8,250	152	--	--	8,402
Limber pine	--	218	--	66	284
Western larch	60,172	13,391	16,129	15,762	105,454
Grand fir	358,959	86,916	94,661	52,897	593,433
Subalpine fir	106,581	9,812	5,190	928	122,511
White fir	4,138	--	--	--	4,138
Engelmann spruce	143,528	8,845	7,222	2,384	161,979
Western hemlock	147,584	15,850	15,194	6,382	185,010
Western redcedar	105,465	30,088	26,347	13,716	175,616
Total softwoods	1,863,757	364,868	261,022	417,179	2,906,826
Aspen	1,657	11,474	319	4,935	18,385
Cottonwood	297	710	1,748	7,850	10,605
Total hardwoods	1,954	12,184	2,067	12,785	28,990
All species	1,865,711	377,052	263,089	429,964	2,935,816

Table 26.--Net annual growth of sawtimber (Scribner rule) on timberland in Idaho by ownership class and species, 1980

Species	Ownership class				Total
	National Forest	Other public	Forest industry	Nonindustrial private	
	- - - - - - - - Thousand board feet, Scribner rule - - - - - -				
Douglas-fir	466,959	112,313	57,478	153,837	790,587
Ponderosa pine	121,827	33,809	18,312	82,322	256,270
Western white pine	46,095	12,265	2,747	19,839	80,946
Lodgepole pine	191,999	18,944	8,108	34,641	253,692
Whitebark pine	7,341	142	--	--	7,483
Limber pine	--	199	--	60	259
Western larch	53,553	12,267	14,840	14,489	95,149
Grand fir	319,474	76,951	85,021	48,436	529,882
Subalpine fir	94,856	9,036	4,751	1,095	109,738
White fir	3,683	--	--	--	3,683
Engelmann spruce	127,740	7,962	6,488	2,146	144,336
Western hemlock	131,349	14,285	14,041	6,002	165,677
Western redcedar	93,864	25,950	22,551	11,853	154,218
Total softwoods	1,658,740	324,123	234,337	374,720	2,591,920
Aspen	1,475	8,936	298	4,044	14,753
Cottonwood	264	653	1,629	7,327	9,873
Total hardwoods	1,739	9,589	1,927	11,371	24,626
All species	1,660,479	333,712	236,264	386,091	2,616,546

Table 27.--Net annual growth of growing stock on timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand cubic feet													
Douglas-fir	23,095	20,282	23,070	22,741	22,284	17,982	12,653	9,175	6,661	4,415	3,297	2,152	3,668	171,475
Ponderosa pine	4,712	3,834	4,216	5,606	5,232	4,575	3,602	3,623	3,220	2,320	2,454	1,917	7,762	53,073
Western white pine	1,154	670	1,967	2,660	1,093	1,751	1,918	210	142	809	191	-23	929	13,471
Lodgepole pine	28,847	26,481	17,290	9,847	2,687	1,507	-54	44	-18	-96	-36	-23	5	86,481
Whitebark pine	762	505	333	-62	180	136	86	43	64	-64	14	21	41	2,059
Limber pine	2	41	14	1	8	-13	([1])	3	1	--	([1])	1	--	58
Western larch	6,612	4,580	4,485	3,791	3,331	1,438	1,091	1,011	223	-336	-199	-261	228	25,994
Grand fir	21,160	15,977	17,393	15,000	13,830	10,179	8,810	6,017	3,177	3,269	3,145	1,949	5,768	125,674
Subalpine fir	12,940	6,752	4,711	3,590	3,431	1,774	1,205	433	61	46	241	61	-321	34,924
White fir	21	39	30	52	66	80	65	55	44	62	49	30	244	837
Engelmann spruce	2,949	3,698	4,021	3,520	4,013	3,247	2,355	2,570	1,978	1,251	989	788	1,405	32,784
Western hemlock	4,860	4,667	4,999	4,354	4,511	2,968	2,275	1,697	1,264	904	639	464	694	34,296
Western redcedar	15,333	4,433	5,098	4,270	4,222	2,965	2,751	1,794	1,707	1,188	1,222	1,286	3,246	49,515
Total softwoods	122,447	91,959	87,627	75,370	64,888	48,589	36,757	26,675	18,524	13,768	12,006	8,362	23,669	630,641
Aspen	9,595	2,240	1,087	574	214	165	72	31	43	4	--	3	--	14,028
Cottonwood	554	171	386	643	422	-122	459	-25	234	252	83	50	321	3,428
Total hardwoods	10,149	2,411	1,473	1,217	636	43	531	6	277	256	83	53	321	17,456
All species	132,596	94,370	89,100	76,587	65,524	48,632	37,288	26,681	18,801	14,024	12,089	8,415	23,990	648,097

[1]Less than 0.05 thousand cubic feet.

Table 28.--Net annual growth of sawtimber (International ¼-inch rule) on timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	216,262	151,678	144,699	113,141	78,589	56,593	41,794	27,871	20,384	13,031	20,864	884,906
Ponderosa pine	28,608	38,767	35,294	31,061	23,408	23,426	20,531	14,663	15,651	12,771	48,536	292,716
Western white pine	21,302	17,717	8,977	11,682	11,749	2,952	2,232	4,951	1,618	193	6,028	89,401
Lodgepole pine	201,538	56,812	16,134	8,980	-79	330	35	-484	-193	-118	21	282,976
Whitebark pine	5,822	-408	946	871	505	293	357	-441	79	117	261	8,402
Limber pine	279	6	41	-75	2	20	5	--	2	4	--	284
Western larch	34,940	25,854	21,941	9,450	7,072	6,923	1,653	-1,699	-930	-1,340	1,590	105,454
Grand fir	147,668	97,035	85,282	60,909	52,015	36,146	20,410	21,407	20,227	13,311	39,023	593,433
Subalpine fir	57,951	22,169	20,212	10,566	7,101	2,720	949	432	1,431	358	-1,378	122,511
White fir	137	269	343	413	336	284	240	339	269	163	1,345	4,138
Engelmann spruce	26,978	19,773	22,803	18,428	13,585	15,047	14,015	9,280	7,023	5,622	9,425	161,979
Western hemlock	38,970	32,361	33,176	21,548	16,533	12,489	9,511	7,032	4,748	3,510	5,132	185,010
Western redcedar	37,540	23,160	22,540	15,644	14,498	9,164	9,897	7,322	7,593	7,971	20,287	175,616
Total softwoods	817,995	485,193	412,388	302,618	225,314	166,387	121,629	90,673	77,902	55,593	151,134	2,906,826
Aspen	XXXXX	15,698	1,147	812	355	135	200	22	--	16	--	18,385
Cottonwood	XXXXX	3,286	2,043	-798	1,974	-229	1,007	1,114	386	242	1,580	10,605
Total hardwoods	XXXXX	18,984	3,190	14	2,329	-94	1,207	1,136	386	258	1,580	28,990
All species	817,995	504,177	415,578	302,632	227,643	166,293	122,836	91,809	78,288	55,851	152,714	2,935,816

Table 29.--Net annual growth of sawtimber (Scribner rule) on timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Douglas-fir	191,762	136,045	129,965	101,404	70,462	50,639	37,197	24,806	18,142	11,597	18,568	790,587
Ponderosa pine	21,349	34,142	31,265	27,702	20,708	20,668	18,264	13,353	14,141	11,387	43,291	256,270
Western white pine	19,101	16,246	8,378	10,537	10,598	2,650	2,048	4,412	1,440	171	5,365	80,946
Lodgepole pine	179,984	51,255	14,718	8,126	-28	294	30	-430	-171	-105	19	253,692
Whitebark pine	5,182	-361	845	775	451	260	318	-393	70	104	232	7,483
Limber pine	249	5	38	-63	2	18	5	--	1	4	--	259
Western larch	30,889	23,363	19,967	8,802	6,447	6,255	1,526	-1,496	-827	-1,192	1,415	95,149
Grand fir	128,743	87,969	77,166	55,037	46,825	32,340	18,169	19,055	18,001	11,847	34,730	529,882
Subalpine fir	51,796	20,003	18,087	9,471	6,341	2,440	849	385	1,274	319	-1,227	109,738
White fir	122	239	305	368	299	253	214	302	239	145	1,197	3,683
Engelmann spruce	24,030	17,652	20,331	16,432	12,112	13,403	12,474	8,259	6,251	5,004	8,388	144,336
Western hemlock	34,705	29,096	29,982	19,332	14,718	11,115	8,537	6,276	4,225	3,123	4,568	165,677
Western redcedar	33,314	20,069	19,179	13,162	12,634	8,251	8,960	6,618	6,780	7,122	18,129	154,218
Total softwoods	721,226	435,723	370,226	271,085	201,569	148,586	108,591	81,147	69,566	49,526	134,675	2,591,920
Aspen	XXXXX	12,283	1,054	754	330	121	178	19	--	14	--	14,753
Cottonwood	XXXXX	3,020	1,881	-579	1,831	-150	908	996	344	216	1,406	9,873
Total hardwoods	XXXXX	15,303	2,935	175	2,161	-29	1,086	1,015	344	230	1,406	24,626
All species	721,226	451,026	373,161	271,260	203,730	148,557	109,677	82,162	69,910	49,756	136,081	2,616,546

Table 30.--Annual mortality of growing stock on timberland in Idaho by ownership class and species, 1980

Species	Ownership class				Total
	National Forest	Other public	Forest industry	Nonindustrial private	
	Thousand cubic feet				
Douglas-fir	16,728	2,928	1,490	3,089	24,235
Ponderosa pine	3,262	563	1,336	1,485	6,646
Western white pine	11,819	2,383	1,796	1,014	17,012
Lodgepole pine	16,606	1,219	561	851	19,237
Whitebark pine	727	5	--	--	732
Limber pine	--	14	--	--	14
Western larch	3,138	614	961	1,312	6,025
Grand fir	5,511	1,090	2,592	2,994	12,187
Subalpine fir	14,519	481	--	481	15,481
White fir	232	--	--	--	232
Engelmann spruce	5,340	238	--	--	5,578
Western hemlock	919	242	214	277	1,652
Western redcedar	2,155	32	632	153	2,972
Total softwoods	80,956	9,809	9,582	11,656	112,003
Aspen	363	173	1	1,468	2,005
Cottonwood	246	29	--	713	988
Total hardwoods	609	202	1	2,181	2,993
All species	81,565	10,011	9,583	13,837	114,996

Table 31.--Annual mortality of sawtimber (International ¼-inch rule) on timberland in Idaho by ownership class and species, 1980

Species	Ownership class				Total
	National Forest	Other public	Forest industry	Nonindustrial private	
	Thousand board feet, International ¼-inch rule				
Douglas-fir	85,304	11,726	4,931	13,013	114,974
Ponderosa pine	17,622	2,840	6,993	7,019	34,474
Western white pine	51,140	13,939	2,714	3,366	71,159
Lodgepole pine	67,658	3,825	3,227	2,653	77,363
Whitebark pine	4,002	29	--	--	4,031
Limber pine	--	77	--	--	77
Western larch	15,734	2,905	4,008	3,536	26,183
Grand fir	31,049	4,822	10,689	11,445	58,005
Subalpine fir	63,669	2,178	--	2,035	67,882
White fir	1,038	--	--	--	1,038
Engelmann spruce	29,950	1,378	--	--	31,328
Western hemlock	4,678	1,303	966	1,326	8,273
Western redcedar	10,694	176	2,168	770	13,808
Total softwoods	382,538	45,198	35,696	45,163	508,595
Aspen	559	101	--	--	660
Cottonwood	75	140	--	3,468	3,683
Total hardwoods	634	241	--	3,468	4,343
All species	383,172	45,439	35,696	48,631	512,938

Table 32.--Annual mortality of sawtimber (Scribner rule) on timberland in Idaho by ownership class and species, 1980

Species	Ownership class				Total
	National Forest	Other public	Forest industry	Nonindustrial private	
	- - - - - - Thousand board feet, Scribner rule - - - - - - - -				
Douglas-fir	75,921	10,051	4,198	10,876	101,046
Ponderosa pine	15,683	2,376	5,719	5,685	29,463
Western white pine	45,513	12,136	2,378	2,879	62,906
Lodgepole pine	60,216	3,199	2,685	2,323	68,423
Whitebark pine	3,562	24	--	--	3,586
Limber pine	--	64	--	--	64
Western larch	14,005	2,395	3,475	3,143	23,018
Grand fir	27,634	4,136	9,153	9,749	50,672
Subalpine fir	56,665	1,833	--	1,715	60,213
White fir	925	--	--	--	925
Engelmann spruce	26,656	1,192	--	--	27,848
Western hemlock	4,164	1,127	742	1,050	7,083
Western redcedar	9,518	140	1,811	594	12,063
Total softwoods	340,462	38,673	30,161	38,014	447,310
Aspen	498	89	--	--	587
Cottonwood	67	121	--	2,997	3,185
Total hardwoods	565	210	--	2,997	3,772
All species	341,027	38,883	30,161	41,011	451,082

Table 33.--Annual mortality of growing stock on timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand cubic feet													
Douglas-fir	1,513	1,921	2,134	1,825	2,629	1,703	2,292	1,981	1,113	1,547	1,154	788	3,635	24,235
Ponderosa pine	249	389	225	664	479	1,115	619	57	209	949	119	170	1,402	6,646
Western white pine	1,055	1,989	1,522	1,050	2,613	1,102	1,348	1,729	1,369	915	878	672	770	17,012
Lodgepole pine	1,907	2,868	4,294	3,598	3,268	1,394	1,090	365	245	132	49	27	--	19,237
Whitebark pine	23	26	23	315	75	90	39	3	5	98	1	3	31	732
Limber pine	--	--	--	--	--	14	--	--	--	--	--	--	--	14
Western larch	635	612	704	144	217	792	427	109	465	784	369	379	388	6,025
Grand fir	752	1,270	1,366	1,807	1,312	1,310	1,246	553	774	531	229	477	560	12,187
Subalpine fir	791	1,697	2,784	2,455	1,564	1,734	1,070	1,182	838	494	237	95	540	15,481
White fir	14	23	7	12	21	22	21	18	12	11	15	5	51	232
Engelmann spruce	109	195	300	390	293	531	760	456	324	592	732	46	850	5,578
Western hemlock	7	85	525	233	78	80	214	57	1	114	9	34	215	1,652
Western redcedar	168	488	--	168	--	314	48	555	237	224	34	--	736	2,972
Total softwoods	7,223	11,563	13,884	12,661	12,549	10,201	9,174	7,065	5,592	6,391	3,826	2,696	9,178	112,003
Aspen	620	1,021	220	82	44	12	6	--	--	--	--	--	--	2,005
Cottonwood	232	--	--	--	--	551	--	205	--	--	--	--	--	988
Total hardwoods	852	1,021	220	82	44	563	6	205	--	--	--	--	--	2,993
All species	8,075	12,584	14,104	12,743	12,593	10,764	9,180	7,270	5,592	6,391	3,826	2,696	9,178	114,996

Table 34.--Annual mortality of sawtimber (International ¼-inch rule) on timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	8,560	9,923	14,174	9,028	12,847	11,259	6,689	8,828	6,931	4,880	21,855	114,974
Ponderosa pine	704	2,946	2,695	6,345	3,690	333	1,281	5,915	646	1,148	8,771	34,474
Western white pine	5,571	5,458	13,404	5,430	6,860	8,994	7,032	4,963	4,984	3,964	4,499	71,159
Lodgepole pine	21,186	20,026	18,367	7,619	5,811	1,952	1,305	691	267	139	--	77,363
Whitebark pine	74	1,841	479	561	203	15	25	659	7	17	150	4,031
Limber pine	--	--	--	77	--	--	--	--	--	--	--	77
Western larch	2,500	967	1,389	4,601	2,366	565	2,437	4,787	2,052	2,122	2,397	26,183
Grand fir	5,197	9,865	7,498	7,762	6,807	3,013	5,485	2,853	1,437	3,418	4,670	58,005
Subalpine fir	12,278	13,022	8,432	9,736	5,914	6,541	4,705	2,696	1,408	505	2,645	67,882
White fir	31	64	107	114	110	93	67	58	83	28	283	1,038
Engelmann spruce	1,552	2,500	1,819	2,954	4,395	2,519	1,687	3,771	4,475	250	5,406	31,328
Western hemlock	2,144	1,054	472	422	1,328	320	4	734	63	204	1,528	8,273
Western redcedar	--	850	--	1,680	249	3,202	1,117	1,051	290	--	5,369	13,808
Total softwoods	59,797	68,516	68,836	56,329	50,580	38,806	31,834	37,006	22,643	16,675	57,573	508,595
Aspen	XXXXX	387	195	52	26	--	--	--	--	--	--	660
Cottonwood	XXXXX	--	--	2,714	--	969	--	--	--	--	--	3,683
Total hardwoods	XXXXX	387	195	2,766	26	969	--	--	--	--	--	4,343
All species	59,797	68,903	69,031	59,095	50,606	39,775	31,834	37,006	22,643	16,675	57,573	512,938

Table 35.--Annual mortality of sawtimber (Scribner rule) on timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Douglas-fir	7,234	8,552	12,244	7,917	11,326	10,000	5,953	7,857	6,169	4,343	19,451	101,046
Ponderosa pine	458	2,185	2,250	5,307	3,218	296	1,140	5,206	575	1,022	7,806	29,463
Western white pine	4,934	4,609	11,806	4,812	6,100	8,003	6,258	4,417	4,435	3,528	4,004	62,906
Lodgepole pine	18,620	17,764	16,225	6,775	5,165	1,737	1,161	615	237	124	--	68,423
Whitebark pine	66	1,638	425	499	181	13	22	587	6	15	134	3,586
Limber pine	--	--	--	64	--	--	--	--	--	--	--	64
Western larch	2,190	784	1,206	3,973	2,095	500	2,168	4,254	1,826	1,889	2,133	23,018
Grand fir	4,411	8,360	6,519	6,821	6,001	2,661	4,882	2,539	1,279	3,042	4,157	50,672
Subalpine fir	10,897	11,446	7,492	8,656	5,260	5,819	4,186	2,400	1,254	449	2,354	60,213
White fir	28	57	95	101	98	83	60	52	74	25	252	925
Engelmann spruce	1,381	2,211	1,611	2,623	3,905	2,242	1,502	3,356	3,983	223	4,811	27,848
Western hemlock	1,749	819	420	373	1,182	285	4	653	56	182	1,360	7,083
Western redcedar	--	659	--	1,495	222	2,840	933	878	258	--	4,778	12,063
Total softwoods	51,968	59,084	60,293	49,416	44,753	34,479	28,269	32,814	20,152	14,842	51,240	447,310
Aspen	XXXXX	344	174	46	23	--	--	--	--	--	--	587
Cottonwood	XXXXX	--	--	2,338	--	847	--	--	--	--	--	3,185
Total hardwoods	XXXXX	344	174	2,384	23	847	--	--	--	--	--	3,772
All species	51,968	59,428	60,467	51,800	44,776	35,326	28,269	32,814	20,152	14,842	51,240	451,082

Table 36.--Annual mortality of growing stock on timberland in Idaho by cause of death and species, 1980

Species	Cause of death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand cubic feet								
Douglas-fir	2,792	7,151	207	--	8,591	184	--	5,310	24,235
Ponderosa pine	3,620	1,345	--	--	693	104	43	841	6,646
Western white pine	2,699	13,474	--	--	--	--	154	685	17,012
Lodgepole pine	5,864	6,624	--	--	205	4,248	--	2,296	19,237
Whitebark pine	--	--	--	--	--	--	--	732	732
Limber pine	--	14	--	--	--	--	--	--	14
Western larch	2,552	1,398	--	--	587	50	61	1,377	6,025
Grand fir	4,356	6,006	--	--	723	37	182	883	12,187
Subalpine fir	225	773	--	--	579	--	--	13,904	15,481
White fir	--	--	--	--	--	--	--	232	232
Engelmann spruce	--	515	--	--	3,094	--	375	1,594	5,578
Western hemlock	--	--	--	--	192	--	482	978	1,652
Western redcedar	--	597	--	--	1,753	--	622	--	2,972
Total softwoods	22,108	37,897	207	--	16,417	4,623	1,919	28,832	112,003
Aspen	--	1,502	--	--	--	17	22	464	2,005
Cottonwood	--	--	--	--	--	--	--	988	988
Total hardwoods	--	1,502	--	--	--	17	22	1,452	2,993
All species	22,108	39,399	207	--	16,417	4,640	1,941	30,284	114,996

Table 37.--Annual mortality of sawtimber (International ¼-inch rule) on timberland in Idaho by cause of death and species, 1980

Species	Cause of death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand board feet, International ¼-inch rule								
Douglas-fir	17,205	29,203	1,434	--	51,031	155	--	15,946	114,974
Ponderosa pine	19,328	7,947	--	--	3,510	--	211	3,478	34,474
Western white pine	14,044	52,949	--	--	--	--	--	4,166	71,159
Lodgepole pine	27,207	41,603	--	--	1,283	--	--	7,270	77,363
Whitebark pine	--	--	--	--	--	--	--	4,031	4,031
Limber pine	--	77	--	--	--	--	--	--	77
Western larch	13,108	2,679	--	--	917	--	--	9,479	26,183
Grand fir	21,011	30,186	--	--	2,201	--	--	4,607	58,005
Subalpine fir	1,241	4,205	--	--	3,061	--	--	59,375	67,882
White fir	--	--	--	--	--	--	--	1,038	1,038
Engelmann spruce	--	2,705	--	--	18,028	--	2,001	8,594	31,328
Western hemlock	--	--	--	--	838	--	2,223	5,212	8,273
Western redcedar	--	3,671	--	--	10,137	--	--	--	13,808
Total softwoods	113,144	175,225	1,434	--	91,006	155	4,435	123,196	508,595
Aspen	--	--	--	--	--	--	660	--	660
Cottonwood	--	--	--	--	--	--	--	3,683	3,683
Total hardwoods	--	--	--	--	--	--	660	3,683	4,343
All species	113,144	175,225	1,434	--	91,006	155	5,095	126,879	512,938

Table 38.--Annual mortality of sawtimber (Scribner rule) on timberland in Idaho by cause of death and species, 1980

Species	Cause of death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand board feet, Scribner rule								
Douglas-fir	15,158	25,679	1,327	--	45,534	96	--	13,252	101,046
Ponderosa pine	16,810	6,908	--	--	2,985	--	169	2,591	29,463
Western white pine	12,565	46,746	--	--	--	--	--	3,595	62,906
Lodgepole pine	24,720	36,375	--	--	1,084	--	--	6,244	68,423
Whitebark pine	--	--	--	--	--	--	--	3,586	3,586
Limber pine	--	64	--	--	--	--	--	--	64
Western larch	11,822	2,324	--	--	833	--	--	8,039	23,018
Grand fir	18,416	26,425	--	--	1,927	--	--	3,904	50,672
Subalpine fir	1,035	3,819	--	--	2,766	--	--	52,593	60,213
White fir	--	--	--	--	--	--	--	925	925
Engelmann spruce	--	2,266	--	--	16,167	--	1,822	7,593	27,848
Western hemlock	--	--	--	--	723	--	1,798	4,562	7,083
Western redcedar	--	3,029	--	--	9,034	--	--	--	12,063
Total softwoods	100,526	153,635	1,327	--	81,053	96	3,789	106,884	447,310
Aspen	--	--	--	--	--	--	587	--	587
Cottonwood	--	--	--	--	--	--	--	3,185	3,185
Total hardwoods	--	--	--	--	--	--	587	3,185	3,772
All species	100,526	153,635	1,327	--	81,053	96	4,376	110,069	451,082

Table 39.--Annual removals[1] of growing stock on timberland in Idaho by ownership class and species, 1980

Species	Ownership class				Total
	National Forest	Other public	Forest industry	Nonindustrial private	
	Thousand cubic feet				
Douglas-fir	29,865	7,055	26,555	16,677	80,152
Engelmann spruce	4,128	976	3,670	2,305	11,079
Lodgepole pine	11,463	2,708	10,193	6,401	30,765
Ponderosa pine	15,799	3,732	14,048	8,822	42,401
True-firs[2]	34,550	8,163	30,722	19,293	92,728
Western larch	8,120	1,918	7,220	4,534	21,792
Western hemlock	2,114	499	1,880	1,181	5,674
Western redcedar	17,974	4,247	15,982	10,036	48,239
Western whitepine	12,387	2,926	11,015	6,918	33,246
Other species	421	100	374	236	1,131
All species	136,821	32,324	121,659	76,403	367,207

[1]Includes sawlogs, veneer logs, pulpwood, cedar products, utility poles, house logs, posts and poles, logging residues, and other removals.

[2]Includes grand and subalpine fir.

Table 40.--Annual removals[1] of sawtimber (International ¼-inch rule) on timberland in Idaho by ownership class and species, 1980

Species	Ownership class				Total
	National Forest	Other public	Forest industry	Nonindustrial private	
	Thousand board feet, International ¼-inch rule				
Douglas-fir	172,381	40,581	152,572	96,261	461,795
Engelmann spruce	23,828	5,609	21,089	13,306	63,832
Lodgepole pine	66,166	15,576	58,562	36,948	177,252
Ponderosa pine	91,191	21,468	80,712	50,922	244,293
True-firs[2]	199,428	46,949	176,512	111,363	534,252
Western larch	46,867	11,034	41,482	26,171	125,554
Western hemlock	12,203	2,873	10,801	6,814	32,691
Western redcedar	103,747	24,424	91,825	57,933	277,929
Western whitepine	71,501	16,833	63,285	39,927	191,546
Other species	2,432	573	2,153	1,358	6,516
All species	789,744	185,920	698,993	441,003	2,115,660

[1]Includes sawlogs, veneer logs, pulpwood, cedar products, utility poles, house logs, posts and poles, logging residues, and other removals.

[2]Includes grand and subalpine fir.

Table 41.--Annual removals[1] of sawtimber (Scribner rule) on timberland in Idaho by ownership class and species, 1980

Species	Ownership class				Total
	National Forest	Other public	Forest industry	Nonindustrial private	
	- - - - - - - Thousand board feet, Scribner rule - - - - - - -				
Douglas-fir	142,013	33,643	126,714	79,548	381,918
Engelmann spruce	19,630	4,650	17,515	10,995	52,790
Lodgepole pine	54,510	12,913	48,637	30,533	146,593
Ponderosa pine	75,127	17,797	67,033	42,082	202,039
True-firs[2]	164,296	38,922	146,595	92,030	441,843
Western larch	38,612	9,147	34,452	21,628	103,839
Western hemlock	10,053	2,382	8,970	5,632	27,037
Western redcedar	85,471	20,248	76,263	47,877	229,859
Western whitepine	58,906	13,955	52,559	32,996	158,416
Other species	2,003	475	1,788	1,122	5,388
All species	650,621	154,132	580,526	364,443	1,749,722

[1]Includes sawlogs, veneer logs, pulpwood, cedar products, utility poles, house logs, posts and poles, logging residues, and other removals.

[2]Includes grand and subalpine fir.

Table 42.--Annual removals of growing stock on timberland in Idaho by source and ownership class, 1980

Source	Ownership class							Total Removals
	National Forest	Other public			Private			
		Other Federal	State	Total	Forest industry	Nonindustrial private	Total	
	- - - - - - - - - - - - - - - - - - Thousand cubic feet - - - - - - - - - - - - - - - - - -							
Roundwood products:								
Sawlogs	91,983	1,911	15,527	17,438	55,091	53,521	108,612	218,033
Veneer logs	9,176	602	5,420	6,022	27,280	1,221	28,501	43,699
Total	101,159	2,513	20,947	23,460	82,371	54,742	137,113	261,732
Other roundwood products:								
Pulpwood	14,745	233	3,209	3,442	22,825	11,194	34,019	52,206
Cedar products	1,924	62	732	794	2,244	1,126	3,370	6,088
Utility poles	556	--	771	771	80	392	472	1,799
Houselogs	1,842	--	79	79	51	59	110	2,031
Posts and poles	898	--	69	69	131	125	256	1,223
Total	19,965	295	4,860	5,155	25,331	12,896	38,227	63,347
Total roundwood products	121,124	2,808	25,807	28,615	107,702	67,638	175,340	325,079
Logging residues	14,305	332	3,048	3,380	12,720	7,988	20,708	38,393
Other removals	1,392	32	297	329	1,237	777	2,014	3,735
Total removals	136,821	3,172	29,152	32,324	121,659	76,403	198,062	367,207

Table 43.--Annual removals of sawtimber (International ¼-inch rule) on timberland in Idaho by source and ownership class, 1980

Source	Ownership class							
		Other public			Private			
	National Forest	Other Federal	State	Total	Forest industry	Nonindustrial private	Total	Total Removals
	Thousand board feet, International ¼-inch rule							
Roundwood products:								
Sawlogs	573,735	11,920	96,848	108,768	343,625	333,832	677,457	1,359,960
Veneer logs	57,235	3,755	33,807	37,562	170,157	7,616	177,773	272,570
Total	630,970	15,675	130,655	146,330	513,782	341,448	855,230	1,632,530
Other roundwood products:								
Pulpwood	81,385	1,286	17,712	18,998	125,982	61,785	187,767	288,150
Cedar products	8,945	288	3,403	3,691	10,433	5,235	15,668	28,304
Utility poles	2,585	--	3,585	3,585	372	1,822	2,194	8,364
Houselogs	8,564	--	367	367	237	274	511	9,442
Posts and poles	3,705	--	285	285	540	516	1,056	5,046
Total	105,184	1,574	25,352	26,926	137,564	69,632	207,196	339,306
Total roundwood products	736,154	17,249	156,007	173,256	651,346	411,080	1,062,426	1,971,836
Logging residues	44,921	1,043	9,571	10,614	39,944	25,084	65,028	120,563
Other removals	8,669	200	1,850	2,050	7,703	4,839	12,542	23,261
Total removals	789,744	18,492	167,428	185,920	698,993	441,003	1,139,996	2,115,660

Table 44.--Annual removals of sawtimber (Scribner rule) on timberland in Idaho by source and ownership class, 1980

Source	Ownership class							
		Other public			Private			
	National Forest	Other Federal	State	Total	Forest industry	Nonindustrial private	Total	Total Removals
	Thousand board feet, Scribner rule							
Roundwood products:								
Sawlogs	459,917	9,554	77,638	87,192	275,456	267,605	543,061	1,090,170
Veneer logs	45,878	3,010	27,099	30,109	136,398	6,103	142,501	218,488
Total	505,795	12,564	104,737	117,301	411,854	273,708	685,562	1,308,658
Other roundwood products:								
Pulpwood	73,727	1,163	16,043	17,206	114,126	55,972	170,098	261,031
Cedar products	9,620	308	3,660	3,968	11,222	5,628	16,850	30,438
Utility poles	2,780	--	3,855	3,855	400	1,958	2,358	8,993
Houselogs	9,208	--	393	393	256	296	552	10,153
Posts and poles	1,796	--	138	138	262	250	512	2,446
Total	97,131	1,471	24,089	25,560	126,266	64,104	190,370	313,061
Total roundwood products	602,926	14,035	128,826	142,861	538,120	337,812	875,932	1,621,719
Logging residues	39,980	929	8,518	9,447	35,550	22,325	57,875	107,302
Other removals	7,715	178	1,646	1,824	6,856	4,306	11,162	20,701
Total removals	650,621	15,142	138,990	154,132	580,526	364,443	944,969	1,749,722

Table 45.--Total land area on National Forests in Idaho by forest type and land class, 1981

Item	Land class			
	Deferred	Reserved	Nonreserved	Total
	- - - - - - - - - - - Thousand acres - - - - - - - - - - -			
Forest land				
Forest type:				
Douglas-fir	373.9	847.1	4,357.4	5,578.4
Hemlock	9.3	27.1	388.3	424.7
Ponderosa pine	118.0	168.8	1,156.5	1,443.3
Western white pine	1.7	6.7	131.0	139.4
Lodgepole pine	203.7	685.0	2,644.2	3,532.9
Western larch	20.8	45.2	528.5	594.5
Western redcedar	9.6	20.3	252.1	282.0
Grand fir	60.6	116.3	922.3	1,099.2
Engelmann spruce-fir	128.5	542.7	2,247.4	2,918.6
Aspen	5.7	17.7	136.6	160.0
Cottonwood	3.5	14.6	43.2	61.3
Oak	--	1.0	--	1.0
Total forest land	935.3	2,492.5	12,807.5	16,235.3
Nonforest land				4,187.5
Total land area				20,422.8

Table 46.--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on National Forest timberland in Idaho by softwoods and hardwoods.

Species	Growing stock	Sawtimber	
		International ¼-inch rule	Scribner rule
	- Million cubic feet -	- Million board feet -	
Net volume, 1981:			
Softwoods	21,589.0	95,429.7	84,933.1
Hardwoods	66.9	105.1	93.6
Total	21,655.9	95,534.8	85,026.7
	- Thousand cubic feet -	- Thousand board feet -	
Net annual growth, 1980:			
Softwoods	381,163	1,863,757	1,658,740
Hardwoods	1,436	1,954	1,739
Total	382,599	1,865,711	1,660,479
Annual mortality, 1980:			
Softwoods	80,956	382,538	340,462
Hardwoods	609	634	565
Total	81,565	383,172	341,027

Table 47.--Area of National Forest timberland in Idaho by forest type and stand-size class, 1981

Forest type	Stand-size class				
	Sawtimber	Poletimber	Sapling and seedling	Nonstocked	Total
	- - - - - - - - - - - Thousand acres - - - - - - - - - - -				
Douglas-fir	2,346.5	241.7	249.1	124.6	2,961.9
Hemlock	214.7	72.1	76.0	6.1	368.9
Ponderosa pine	737.0	14.5	48.9	51.1	851.5
Western white pine	80.3	41.0	1.9	--	123.2
Lodgepole pine	820.4	764.7	241.4	55.9	1,882.4
Western larch	178.9	143.4	157.8	6.5	486.6
Western redcedar	228.4	4.9	10.4	2.8	246.5
Grand fir	590.1	123.3	131.1	0.6	845.1
Engelmann spruce-fir	1,010.9	162.3	99.5	39.5	1,312.2
Aspen	23.0	24.9	23.1	--	71.0
Cottonwood	3.9	--	--	--	3.9
All types	6,234.1	1,592.8	1,039.2	287.1	9,153.2[1]

[1]Does not include 3,654.3 thousand acres of productivity class 0-19 as this information was not available by stand-size class (Table 11).

Table 48.--Number of growing-stock trees on National Forest timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)															
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand trees															
Douglas-fir	135,259	105,611	87,338	61,054	45,266	33,862	29,135	17,526	11,967	8,457	6,076	4,302	2,860	1,896	4,050	554,659
Ponderosa pine	10,966	7,308	9,467	6,497	3,819	3,726	3,051	2,380	1,592	1,251	1,427	1,247	1,103	935	3,377	58,146
Western white pine	1,996	3,500	4,957	4,756	3,180	2,540	1,915	1,471	1,361	759	628	581	343	204	334	28,525
Lodgepole pine	150,470	207,856	164,548	118,274	63,107	26,166	9,944	3,716	1,318	388	183	44	6	8	4	746,032
Whitebark pine	14,434	8,909	6,722	4,532	2,418	1,316	943	722	249	100	72	31	18	11	19	40,496
Western larch	3,119	9,449	13,739	10,108	7,151	3,943	2,816	1,367	1,055	757	570	330	233	152	388	55,177
Grand fir	71,765	45,069	38,829	25,702	17,023	10,596	7,173	4,530	3,689	2,377	1,533	1,283	961	706	1,487	232,723
Subalpine fir	187,210	119,289	71,286	42,309	27,054	15,218	9,219	5,425	3,062	1,701	1,091	532	319	112	133	483,960
White fir	2,333	1,491	668	529	263	277	216	154	130	77	50	45	36	21	147	6,437
Engelmann spruce	36,083	21,046	16,176	14,030	10,501	7,809	6,331	4,375	3,079	2,474	1,822	1,268	722	466	821	127,003
Western hemlock	43,406	21,589	18,196	9,996	7,539	4,319	4,028	2,418	1,752	1,039	684	560	263	224	358	116,371
Western redcedar	48,416	22,741	11,166	8,359	5,562	4,381	3,173	1,772	1,695	1,356	908	672	535	479	1,151	112,366
Total softwoods	705,457	573,858	443,092	306,146	192,883	114,153	77,944	45,856	30,949	20,736	15,044	10,895	7,399	5,214	12,269	2,561,895
Aspen	8,426	7,169	4,068	3,178	1,282	683	270	43	14	--	--	--	--	--	--	25,133
Cottonwood	1,110	624	1,385	307	207	2	12	6	10	3	1	--	1	--	5	3,673
Total hardwoods	9,536	7,793	5,453	3,485	1,489	685	282	49	24	3	1	--	1	--	5	28,806
All species	714,993	581,651	448,545	309,631	194,372	114,838	78,226	45,905	30,973	20,739	15,045	10,895	7,400	5,214	12,274	2,590,701

Table 49.--Net volume of timber on National Forest timberland in Idaho by class of timber, and softwoods and hardwoods, 1981

Class of timber	Softwoods	Hardwoods	All classes
	- - - - - - - - Million cubic feet - - - - - - - -		
Sawtimber trees:			
Saw-log portion	16,764.8	18.6	16,783.4
Upper-stem portion	1,632.2	5.2	1,637.4
Total	18,397.0	23.8	18,420.8
Poletimber trees	3,192.0	43.1	3,235.1
All growing stock trees	21,589.0	66.9	21,655.9
Sound cull trees	121.1	11.1	132.2
Rotten cull trees	338.7	16.9	355.6
Salvable dead trees	1,616.4	7.2	1,623.6
All timber	23,665.2	102.1	23,767.3

Table 50.--Net volume of growing stock and sawtimber on National Forest timberland in Idaho by species, 1981

Species	Growing stock	Sawtimber	
		International ¼-inch rule	Scribner rule
	- Million cubic feet -	- Million board feet -	
Douglas-fir	5,936.0	28,062.4	24,975.5
Ponderosa pine	1,983.5	11,122.6	9,899.1
Western white pine	902.8	4,059.5	3,613.1
Lodgepole pine	3,292.9	9,414.1	8,378.7
Whitebark pine	140.3	562.2	500.4
Western larch	778.8	3,401.4	3,027.2
Grand fir	2,588.4	12,670.6	11,276.9
Subalpine fir	1,800.3	6,804.5	6,056.1
White fir	95.1	485.3	432.0
Engelmann spruce	1,858.2	9,131.6	8,127.2
Western hemlock	1,077.8	4,367.6	3,887.2
Western redcedar	1,134.9	5,347.9	4,759.7
Total softwoods	21,589.0	95,429.7	84,933.1
Aspen	50.9	78.5	69.8
Cottonwood	16.0	26.6	23.8
Total hardwoods	66.9	105.1	93.6
All species	21,655.9	95,534.8	85,026.7

Table 51.--Net volume of growing stock on National Forest timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million cubic feet													
Douglas-fir	161.6	320.5	441.6	545.4	702.8	602.9	548.7	503.8	466.2	388.4	316.5	242.2	695.4	5,936.0
Ponderosa pine	9.3	22.7	32.1	53.7	73.5	82.6	80.9	87.9	127.3	141.9	164.0	169.2	938.4	1,983.5
Western white pine	13.4	37.1	49.0	63.8	71.2	85.8	110.1	82.0	81.4	91.9	64.1	48.4	104.6	902.8
Lodgepole pine	456.2	865.1	844.6	549.2	302.2	154.5	71.7	26.5	15.4	4.6	0.9	1.1	0.9	3,292.9
Whitebark pine	8.0	19.2	20.8	19.3	20.8	23.9	9.8	5.4	4.7	2.5	1.8	1.2	2.9	140.3
Western larch	26.0	58.8	83.2	75.7	84.4	60.5	66.3	63.2	58.7	40.6	34.6	27.1	99.7	778.8
Grand fir	86.8	179.1	212.5	235.3	235.5	217.8	239.8	196.7	165.5	166.0	147.9	123.5	382.0	2,588.4
Subalpine fir	164.5	242.4	290.1	260.8	230.7	189.6	139.9	101.7	78.2	42.6	30.4	11.9	17.5	1,800.3
White fir	1.6	2.8	3.0	5.8	6.8	6.9	8.2	6.5	5.4	6.0	5.6	4.0	32.5	95.1
Engelmann spruce	37.5	89.8	126.5	158.2	193.2	192.1	182.6	194.5	176.1	144.7	96.7	73.2	193.1	1,858.2
Western hemlock	82.5	221.6	88.8	81.6	112.6	97.7	89.8	67.9	56.8	54.6	31.7	26.6	65.6	1,077.8
Western redcedar	24.7	60.8	72.7	93.5	90.6	72.5	91.3	98.6	76.3	67.6	63.3	62.9	260.1	1,134.9
Total softwoods	1,072.1	2,119.9	2,264.9	2,142.3	2,124.3	1,786.8	1,639.1	1,434.7	1,312.0	1,151.4	957.5	791.3	2,792.7	21,589.0
Aspen	8.5	14.4	10.1	9.9	6.2	1.2	0.6	--	--	--	--	--	--	50.9
Cottonwood	4.4	2.5	3.2	([1])	0.3	0.3	0.8	0.1	0.1	--	0.1	--	4.2	16.0
Total hardwoods	12.9	16.9	13.3	9.9	6.5	1.5	1.4	0.1	0.1	--	0.1	--	4.2	66.9
All species	1,085.0	2,136.8	2,278.2	2,152.2	2,130.8	1,788.3	1,640.5	1,434.8	1,312.1	1,151.4	957.6	791.3	2,796.9	21,655.9

[1]Less than 0.05 million cubic feet.

Table 52.--Net volume of sawtimber (International ¼-inch rule) on National Forest timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, International ¼-inch rule											
Douglas-fir	1,731.9	2,675.2	3,523.3	3,035.2	2,808.2	2,601.2	2,510.7	2,110.9	1,763.0	1,371.8	3,931.0	28,062.4
Ponderosa pine	112.1	262.7	386.9	443.9	439.1	498.8	735.1	805.5	930.4	971.2	5,536.9	11,122.6
Western white pine	181.1	295.0	334.7	383.4	497.1	372.1	390.8	453.8	324.9	248.0	578.6	4,059.5
Lodgepole pine	3,512.4	2,915.8	1,580.3	791.4	363.4	134.0	78.5	22.8	4.7	5.9	4.9	9,414.1
Whitebark pine	86.9	98.2	109.4	124.5	50.0	26.5	23.6	12.5	9.2	6.6	14.8	562.2
Western larch	351.7	421.8	444.5	304.9	323.9	301.5	281.4	198.1	169.7	129.3	474.6	3,401.4
Grand fir	777.6	1,159.2	1,200.7	1,138.4	1,283.7	1,065.1	946.7	984.7	895.3	782.5	2,436.7	12,670.6
Subalpine fir	1,191.0	1,300.2	1,158.6	936.1	713.7	521.4	419.2	234.7	168.1	65.0	96.5	6,804.5
White fir	13.6	29.9	35.5	35.6	42.4	33.5	29.5	32.9	31.0	22.0	179.4	485.3
Engelmann spruce	538.5	824.4	1,000.8	991.2	938.3	1,008.2	951.0	817.5	558.8	426.6	1,076.3	9,131.6
Western hemlock	306.3	372.2	552.9	518.1	499.8	394.5	355.3	367.7	222.7	201.5	576.6	4,367.6
Western redcedar	253.8	404.7	400.2	327.7	421.1	458.4	391.7	358.8	349.4	358.7	1,623.4	5,347.9
Total softwoods	9,056.9	10,759.3	10,727.8	9,030.4	8,380.7	7,415.2	7,113.5	6,399.9	5,427.2	4,589.1	16,529.7	95,429.7
Aspen	XXXXXXX	42.6	28.1	5.4	2.4	--	--	--	--	--	--	78.5
Cottonwood	XXXXXXX	--	1.6	1.1	3.3	0.8	0.4	--	0.4	--	19.0	26.6
Total hardwoods	XXXXXXX	42.6	29.7	6.5	5.7	0.8	0.4	--	0.4	--	19.0	105.1
All species	9,056.9	10,801.9	10,757.5	9,036.9	8,386.4	7,416.0	7,113.9	6,399.9	5,427.6	4,589.1	16,548.7	95,534.8

Table 53.--Net volume of sawtimber (Scribner rule) on National Forest timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, Scribner rule											
Douglas-fir	1,541.4	2,380.9	3,135.7	2,701.3	2,499.3	2,315.1	2,234.5	1,878.7	1,569.1	1,220.9	3,498.6	24,975.5
Ponderosa pine	99.8	233.8	344.3	395.1	390.8	443.9	654.2	716.9	828.1	864.4	4,927.8	9,899.1
Western white pine	161.2	262.6	297.9	341.2	442.4	331.2	347.8	403.9	289.2	220.7	515.0	3,613.1
Lodgepole pine	3,126.0	2,595.1	1,406.5	704.3	323.4	119.3	69.9	20.3	4.2	5.3	4.4	8,378.7
Whitebark pine	77.3	87.4	97.4	110.8	44.5	23.6	21.0	11.1	8.2	5.9	13.2	500.4
Western larch	313.0	375.4	395.6	271.4	288.3	268.3	250.4	176.3	151.0	115.1	422.4	3,027.2
Grand fir	692.1	1,031.7	1,068.6	1,013.2	1,142.5	947.9	842.6	876.4	796.8	696.4	2,168.7	11,276.9
Subalpine fir	1,060.0	1,157.2	1,031.2	833.1	635.2	464.0	373.1	208.9	149.6	57.9	85.9	6,056.1
White fir	12.1	26.6	31.6	31.7	37.7	29.8	26.3	29.3	27.6	19.6	159.7	432.0
Engelmann spruce	479.3	733.7	890.7	882.2	835.1	897.3	846.4	727.6	497.3	379.7	957.9	8,127.2
Western hemlock	272.6	331.3	492.1	461.1	444.8	351.1	316.2	327.3	198.2	179.3	513.2	3,887.2
Western redcedar	225.9	360.2	356.2	291.7	374.8	408.0	348.6	319.3	311.0	319.2	1,444.8	4,759.7
Total softwoods	8,060.7	9,575.9	9,547.8	8,037.1	7,458.8	6,599.5	6,331.0	5,696.0	4,830.3	4,084.4	14,711.6	84,933.1
Aspen	XXXXXXX	37.9	25.0	4.8	2.1	--	--	--	--	--	--	69.8
Cottonwood	XXXXXXX	--	1.4	1.0	3.0	0.7	0.4	--	0.4	--	16.9	23.8
Total hardwoods	XXXXXXX	37.9	26.4	5.8	5.1	0.7	0.4	--	0.4	--	16.9	93.6
All species	8,060.7	9,613.8	9,574.2	8,042.9	7,463.9	6,600.2	6,331.4	5,696.0	4,830.7	4,084.4	14,728.5	85,026.7

Table 54.--Net annual growth of growing stock and sawtimber on National Forest timberland in Idaho by species, 1980

Species	Growing stock	Sawtimber	
		International ¼-inch rule	Scribner rule
	- Thousand cubic feet -	- Thousand board feet -	
Douglas-fir	97,203	524,673	466,959
Ponderosa pine	23,267	136,885	121,827
Western white pine	8,522	51,793	46,095
Lodgepole pine	66,227	215,729	191,999
Whitebark pine	1,743	8,250	7,341
Western larch	12,125	60,172	53,553
Grand fir	70,416	358,959	319,474
Subalpine fir	25,578	106,581	94,856
White fir	837	4,138	3,683
Engelmann spruce	28,443	143,528	127,740
Western hemlock	24,577	147,584	131,349
Western redcedar	22,225	105,465	93,864
Total softwoods	381,163	1,863,757	1,658,740
Aspen	870	1,657	1,475
Cottonwood	566	297	264
Total hardwoods	1,436	1,954	1,739
All species	382,599	1,865,711	1,660,479

Table 55.--Net annual growth of growing stock on National Forest timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand cubic feet													
Douglas-fir	11,330	11,565	11,429	11,574	12,041	10,078	7,406	5,623	4,837	3,471	2,591	1,828	3,430	97,203
Ponderosa pine	719	1,156	1,320	1,532	1,516	1,636	1,243	1,144	1,497	1,538	1,632	1,526	6,808	23,267
Western white pine	1,040	1,215	557	1,859	352	1,174	1,118	-166	-218	671	110	293	517	8,522
Lodgepole pine	22,603	20,754	13,316	6,394	2,252	1,045	118	-68	-51	-98	-18	-23	3	66,227
Whitebark pine	489	493	321	-70	178	135	81	42	64	-65	14	20	41	1,743
Western larch	1,864	2,239	2,593	1,988	1,706	779	540	678	3	175	-305	-260	125	12,125
Grand fir	7,702	9,541	9,547	8,388	6,948	5,642	5,837	4,029	2,025	2,669	2,317	1,489	4,282	70,416
Subalpine fir	6,836	5,694	4,217	3,097	2,887	1,405	1,110	312	53	48	193	54	-328	25,578
White fir	21	39	30	52	66	80	65	55	44	62	49	30	244	837
Engelmann spruce	2,314	3,133	3,451	2,992	3,578	2,888	2,156	2,335	1,763	1,096	852	685	1,200	28,443
Western hemlock	2,810	3,084	3,653	3,051	3,359	2,284	1,649	1,271	989	781	529	404	713	24,577
Western redcedar	1,728	2,309	2,186	2,604	2,418	1,403	1,921	1,149	1,282	1,078	1,036	1,041	2,070	22,225
Total softwoods	59,456	61,222	52,620	43,461	37,301	28,549	23,244	16,404	12,288	11,426	9,000	7,087	19,105	381,163
Aspen	326	319	57	98	57	10	3	--	--	--	--	--	--	870
Cottonwood	284	100	136	1	11	5	17	-9	1	--	(1)	--	20	566
Total hardwoods	610	419	193	99	68	15	20	-9	1	--	(1)	--	20	1,436
All species	60,066	61,641	52,813	43,560	37,369	28,564	23,264	16,395	12,289	11,426	9,000	7,087	19,125	382,599

[1]Less than 0.05 thousand cubic feet

Table 56.--Net annual growth of sawtimber (International ¼-inch rule) on National Forest timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	113,400	82,882	81,918	65,416	46,902	35,325	30,812	21,909	15,912	10,992	19,205	524,673
Ponderosa pine	7,362	11,269	10,259	10,898	8,039	7,606	9,663	9,794	10,481	9,941	41,573	136,885
Western white pine	7,779	12,405	4,443	8,368	7,422	677	-60	4,096	1,123	2,041	3,499	51,793
Lodgepole pine	158,911	36,762	13,791	6,515	881	-282	-157	-498	-88	-118	12	215,729
Whitebark pine	5,772	-455	938	863	481	287	355	-444	79	114	260	8,250
Western larch	19,947	14,737	12,051	5,426	3,720	4,645	208	1,435	-1,596	-1,317	916	60,172
Grand fir	65,728	56,121	46,330	36,843	37,820	26,018	14,533	18,282	15,871	10,586	30,827	358,959
Subalpine fir	51,726	19,260	17,188	8,544	6,566	1,996	850	434	1,122	315	-1,420	106,581
White fir	137	269	343	413	336	284	240	339	269	163	1,345	4,138
Engelmann spruce	23,896	16,843	20,388	16,481	12,501	13,700	12,577	8,177	6,050	4,901	8,014	143,528
Western hemlock	29,974	24,163	26,446	17,541	12,910	10,010	7,823	6,281	4,062	3,126	5,248	147,584
Western redcedar	11,843	14,075	13,210	7,964	10,356	6,063	7,835	6,690	6,589	6,650	14,190	105,465
Total softwoods	496,475	288,331	247,305	185,272	147,934	106,329	84,679	76,495	59,874	47,394	123,669	1,863,757
Aspen	XXXXXXX	1,304	298	42	13	--	--	--	--	--	--	1,657
Cottonwood	XXXXXXX	7	64	31	107	-48	4	--	3	--	129	297
Total hardwoods	XXXXXXX	1,311	362	73	120	-48	4	--	3	--	129	1,954
All species	496,475	289,642	247,667	185,345	148,054	106,281	84,683	76,495	59,877	47,394	123,798	1,865,711

Table 57.--Net annual growth of sawtimber (Scribner rule) on National Forest timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Douglas-fir	100,926	73,765	72,907	58,220	41,743	31,439	27,423	19,499	14,162	9,783	17,092	466,959
Ponderosa pine	6,552	10,029	9,131	9,699	7,155	6,769	8,600	8,717	9,328	8,847	37,000	121,827
Western white pine	6,923	11,040	3,954	7,448	6,606	603	-53	3,645	999	1,816	3,114	46,095
Lodgepole pine	141,431	32,718	12,274	5,798	784	-251	-140	-443	-78	-105	11	191,999
Whitebark pine	5,137	-405	835	768	428	255	316	-395	70	101	231	7,341
Western larch	17,753	13,116	10,725	4,829	3,311	4,134	185	1,277	-1,420	-1,172	815	53,553
Grand fir	58,498	49,948	41,234	32,790	33,660	23,156	12,934	16,271	14,125	9,422	27,436	319,474
Subalpine fir	46,036	17,141	15,297	7,604	5,844	1,776	757	386	999	280	-1,264	94,856
White fir	122	239	305	368	299	253	214	302	239	145	1,197	3,683
Engelmann spruce	21,267	14,990	18,145	14,668	11,126	12,193	11,194	7,278	5,385	4,362	7,132	127,740
Western hemlock	26,677	21,505	23,537	15,611	11,490	8,909	6,962	5,590	3,615	2,782	4,671	131,349
Western redcedar	10,540	12,527	11,757	7,088	9,217	5,396	6,973	5,954	5,864	5,919	12,629	93,864
Total softwoods	441,862	256,613	220,101	164,891	131,663	94,632	75,365	68,081	53,288	42,180	110,064	1,658,740
Aspen	XXXXXXX	1,161	265	37	12	--	--	--	--	--	--	1,475
Cottonwood	XXXXXXX	6	57	27	95	-43	4	--	3	--	115	264
Total hardwoods	XXXXXXX	1,167	322	64	107	-43	4	--	3	--	115	1,739
All species	441,862	257,780	220,423	164,955	131,770	94,589	75,369	68,081	53,291	42,180	110,179	1,660,479

Table 58.--Annual mortality of growing stock and sawtimber on National Forest timberland in Idaho by species, 1980

Species	Growing stock	Sawtimber	
		International ¼-inch rule	Scribner rule
	- Thousand cubic feet -	- Thousand board feet -	
Douglas-fir	16,728	85,304	75,921
Ponderosa pine	3,262	17,622	15,683
Western white pine	11,819	51,140	45,513
Lodgepole pine	16,606	67,658	60,216
Whitebark pine	727	4,002	3,562
Western larch	3,138	15,734	14,005
Grand fir	5,511	31,049	27,634
Subalpine fir	14,519	63,669	56,665
White fir	232	1,038	925
Engelmann spruce	5,340	29,950	26,656
Western hemlock	919	4,678	4,164
Western redcedar	2,155	10,694	9,518
Total softwoods	80,956	382,538	340,462
Aspen	363	559	498
Cottonwood	246	75	67
Total hardwoods	609	634	565
All species	81,565	383,172	341,027

Table 59.--Annual mortality of growing stock on National Forest timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand cubic feet													
Douglas-fir	773	925	1,094	1,167	1,374	1,141	1,532	1,742	958	1,080	1,023	703	3,216	16,728
Ponderosa pine	84	309	12	22	41	55	330	57	209	584	119	170	1,270	3,262
Western white pine	324	913	1,469	421	1,700	913	1,060	1,357	1,369	753	697	248	595	11,819
Lodgepole pine	1,553	2,306	3,755	3,423	2,615	1,355	799	365	245	132	31	27	--	16,606
Whitebark pine	23	26	23	315	70	90	39	3	5	98	1	3	31	727
Western larch	148	207	102	58	164	314	366	78	451	169	369	324	388	3,138
Grand fir	353	409	371	584	614	451	295	247	739	208	229	477	534	5,511
Subalpine fir	787	1,661	2,455	2,076	1,524	1,676	1,033	1,163	809	482	218	95	540	14,519
White fir	14	23	7	12	21	22	21	18	12	11	15	5	51	232
Engelmann spruce	109	195	300	354	271	482	677	456	307	561	732	46	850	5,340
Western hemlock	7	79	183	19	78	55	214	57	1	114	9	5	98	919
Western redcedar	168	317	--	4	--	314	48	534	--	--	34	--	736	2,155
Total softwoods	4,343	7,370	9,771	8,455	8,472	6,868	6,414	6,077	5,105	4,192	3,477	2,103	8,309	80,956
Aspen	79	75	83	64	44	12	6	--	--	--	--	--	--	363
Cottonwood	232	--	--	--	--	--	--	14	--	--	--	--	--	246
Total hardwoods	311	75	83	64	44	12	6	14	--	--	--	--	--	609
All species	4,654	7,445	9,854	8,519	8,516	6,880	6,420	6,091	5,105	4,192	3,477	2,103	8,309	81,565

Table 60.--Annual mortality of sawtimber (International ¼-inch rule) on National Forest timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	4,846	6,600	7,525	5,971	8,603	9,888	5,793	6,124	6,159	4,357	19,438	85,304
Ponderosa pine	48	115	213	287	1,965	333	1,281	3,708	646	1,148	7,878	17,622
Western white pine	5,323	1,957	8,124	4,315	5,117	6,688	7,032	3,939	3,834	1,428	3,383	51,140
Lodgepole pine	18,167	19,012	14,612	7,403	4,215	1,952	1,305	691	162	139	--	67,658
Whitebark pine	74	1,841	450	561	203	15	25	659	7	17	150	4,002
Western larch	640	448	1,067	1,711	2,002	377	2,350	934	2,052	1,756	2,397	15,734
Grand fir	1,442	3,382	3,723	3,204	1,884	1,500	5,258	1,301	1,437	3,418	4,500	31,049
Subalpine fir	11,215	11,009	8,222	9,429	5,722	6,441	4,552	2,627	1,302	505	2,645	63,669
White fir	31	64	107	114	110	93	67	58	83	28	283	1,038
Engelmann spruce	1,552	2,302	1,701	2,666	3,918	2,519	1,599	3,562	4,475	250	5,406	29,950
Western hemlock	529	88	472	290	1,328	320	4	734	63	37	813	4,678
Western redcedar	--	22	--	1,680	249	3,084	--	--	290	--	5,369	10,694
Total softwoods	43,867	46,840	46,216	37,631	35,316	33,210	29,266	24,337	20,510	13,083	52,262	382,538
Aspen	XXXXXXX	286	195	52	26	--	--	--	--	--	--	559
Cottonwood	XXXXXXX	--	--	--	--	75	--	--	--	--	--	75
Total hardwoods	XXXXXXX	286	195	52	26	75	--	--	--	--	--	634
All species	43,867	47,126	46,411	37,683	35,342	33,285	29,266	24,337	20,510	13,083	52,262	383,172

Table 61.--Annual mortality of sawtimber (Scribner rule) on National Forest timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Douglas-fir	4,313	5,874	6,697	5,314	7,657	8,800	5,156	5,450	5,482	3,878	17,300	75,921
Ponderosa pine	43	102	190	255	1,749	296	1,140	3,300	575	1,022	7,011	15,683
Western white pine	4,737	1,742	7,230	3,840	4,554	5,952	6,258	3,506	3,412	1,271	3,011	45,513
Lodgepole pine	16,169	16,921	13,005	6,589	3,751	1,737	1,161	615	144	124	--	60,216
Whitebark pine	66	1,638	401	499	181	13	22	587	6	15	134	3,562
Western larch	570	399	950	1,523	1,782	336	2,092	831	1,826	1,563	2,133	14,005
Grand fir	1,283	3,010	3,313	2,852	1,677	1,335	4,680	1,158	1,279	3,042	4,005	27,634
Subalpine fir	9,981	9,798	7,318	8,392	5,093	5,732	4,051	2,338	1,159	449	2,354	56,665
White fir	28	57	95	101	98	83	60	52	74	25	252	925
Engelmann spruce	1,381	2,049	1,514	2,373	3,487	2,242	1,423	3,170	3,983	223	4,811	26,656
Western hemlock	471	78	420	258	1,182	285	4	653	56	33	724	4,164
Western redcedar	--	20	--	1,495	222	2,745	--	--	258	--	4,778	9,518
Total softwoods	39,042	41,688	41,133	33,491	31,433	29,556	26,047	21,660	18,254	11,645	46,513	340,462
Aspen	XXXXXX	255	174	46	23	--	--	--	--	--	--	498
Cottonwood	XXXXXX	--	--	--	--	67	--	--	--	--	--	67
Total hardwoods	XXXXXX	255	174	46	23	67	--	--	--	--	--	565
All species	39,042	41,943	41,307	33,537	31,456	29,623	26,047	21,660	18,254	11,645	46,513	341,027

Table 62.--Annual mortality of growing stock on National Forest timberland in Idaho by cause of death and species, 1980

Species	Cause of Death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand cubic feet								
Douglas-fir	1,927	4,936	143	--	5,930	127	--	3,665	16,728
Ponderosa pine	1,777	660	--	--	340	51	21	413	3,262
Western white pine	1,875	9,361	--	--	--	--	107	476	11,819
Lodgepole pine	5,062	5,718	--	--	177	3,667	--	1,982	16,606
White bark pine	--	--	--	--	--	--	--	727	727
Western larch	1,329	728	--	--	306	26	32	717	3,138
Grand fir	1,970	2,716	--	--	327	17	82	399	5,511
Subalpine fir	211	725	--	--	543	--	--	13,040	14,519
White fir	--	--	--	--	--	--	--	232	232
Engelmann spruce	--	493	--	--	2,962	--	359	1,526	5,340
Western hemlock	--	--	--	--	107	--	268	544	919
Western redcedar	--	433	--	--	1,271	--	451	--	2,155
Total softwoods	14,151	25,770	143	--	11,963	3,888	1,320	23,721	80,956
Aspen	--	272	--	--	--	3	4	84	363
Cottonwood	--	--	--	--	--	--	--	246	246
Total hardwoods	--	272	--	--	--	3	4	330	609
All species	14,151	26,042	143	--	11,963	3,891	1,324	24,051	81,565

Table 63.--Annual mortality of sawtimber (International ¼-inch rule) on National Forest timberland in Idaho by cause of death and species, 1980

Species	Cause of Death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand board feet, International ¼-inch rule								
Douglas-fir	12,765	21,667	1,064	--	37,862	115	--	11,831	85,304
Ponderosa pine	9,880	4,062	--	--	1,794	--	108	1,778	17,622
Western white pine	10,093	38,053	--	--	--	--	--	2,994	51,140
Lodgepole pine	23,794	36,384	--	--	1,122	--	--	6,358	67,658
White bark pine	--	--	--	--	--	--	--	4,002	4,002
Western larch	7,877	1,610	--	--	551	--	--	5,696	15,734
Grand fir	11,247	16,158	--	--	1,178	--	--	2,466	31,049
Subalpine fir	1,164	3,944	--	--	2,871	--	--	55,690	63,669
White fir	--	--	--	--	--	--	--	1,038	1,038
Engelmann spruce	--	2,586	--	--	17,235	--	1,913	8,216	29,950
Western hemlock	--	--	--	--	474	--	1,257	2,947	4,678
Western redcedar	--	2,843	--	--	7,851	--	--	--	10,694
Total softwoods	76,820	127,307	1,064	--	70,938	115	3,278	103,016	382,538
Aspen	--	--	--	--	--	--	559	--	559
Cottonwood	--	--	--	--	--	--	--	75	75
Total hardwoods	--	--	--	--	--	--	559	75	634
All species	76,820	127,307	1,064	--	70,938	115	3,837	103,091	383,172

Table 64.--Annual mortality of sawtimber (Scribner rule) on National Forest timberland in Idaho by cause of death and species, 1980

Species	Cause of Death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand board feet, Scribner rule								
Douglas-fir	11,389	19,294	997	--	34,212	72	--	9,957	75,921
Ponderosa pine	8,948	3,677	--	--	1,589	--	90	1,379	15,683
Western white pine	9,091	33,821	--	--	--	--	--	2,601	45,513
Lodgepole pine	21,755	32,012	--	--	954	--	--	5,495	60,216
White bark pine	--	--	--	--	--	--	--	3,562	3,562
Western larch	7,193	1,414	--	--	507	--	--	4,891	14,005
Grand fir	10,043	14,411	--	--	1,051	--	--	2,129	27,634
Subalpine fir	974	3,594	--	--	2,603	--	--	49,494	56,665
White fir	--	--	--	--	--	--	--	925	925
Engelmann spruce	--	2,169	--	--	15,475	--	1,744	7,268	26,656
Western hemlock	--	--	--	--	425	--	1,057	2,682	4,164
Western redcedar	--	2,390	--	--	7,128	--	--	--	9,518
Total softwoods	69,393	112,782	997	--	63,944	72	2,891	90,383	340,462
Aspen	--	--	--	--	--	--	498	--	498
Cottonwood	--	--	--	--	--	--	--	67	67
Total hardwoods	--	--	--	--	--	--	498	67	565
All species	69,393	112,782	997	--	63,944	72	3,389	90,450	341,027

Table 65.--Area of other public and privately owned forest land in Idaho with percent standard error, 1981

Item	Softwoods		Hardwoods		All types	
	Thousand acres	Percent standard error	Thousand acres	Percent standard error	Thousand acres	Percent standard error
Timberland	4,463.6	±1.0	389.5	± 7.7	4,853.1	±0.9
Woodland	610.8	±2.9	207.6	±12.8	818.4	±3.2
Reserved forest land:[1]						
Timberland	34.5		--		34.5	
Woodland	--		--		--	
Total forest land	5,108.9		597.1		5,706.0	

[1]Reserved land areas are estimated from aerial photos without field verification; therefore, standard errors are not calculated.

Table 66.--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on other public and privately owned timberland in Idaho with percent standard error

Item	Softwoods		Hardwoods		All species	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume, 1981:						
Growing stock (Million cubic feet)	8,597.2	±2.5	333.4	±10.5	8,930.6	±2.4
Sawtimber[1] (Million board feet)	37,666.0	±2.7	674.8	±17.6	38,340.8	±2.7
Sawtimber[2] (Million board feet)	31,849.9	±2.7	580.1	±17.9	32,430.0	±2.7
Net annual growth, 1980:						
Growing stock (Thousand cubic feet)	249,478	±3.7	16,020	±14.7	265,498	±3.6
Sawtimber[1] (Thousand board feet)	1,043,069	±3.5	27,036	±22.0	1,070,105	±3.5
Sawtimber[2] (Thousand board feet)	933,180	±3.5	22,887	±21.0	956,067	±3.4
Annual mortality, 1980:						
Growing stock (Thousand cubic feet)	31,047	±10.3	2,384	±38.2	33,431	±9.9
Sawtimber[1] (Thousand board feet)	126,057	±10.7	3,709	±73.9	129,766	±10.6
Sawtimber[2] (Thousand board feet)	106,848	±10.8	3,207	±73.8	110,055	±10.6

[1]International ¼-inch rule.
[2]Scribner rule.

Table 67.--Total land area on other public and private ownerships in Idaho by forest type and land class, 1981

Item	Land class		
	Reserved	Nonreserved	Total
	- - - - - - - Thousand acres - - - - - - -		
Forest land			
Forest type:			
Timberland:			
Douglas-fir	0.7	1,488.3	1,489.0
Hemlock	--	153.3	153.3
Ponderosa pine	0.5	749.9	750.4
Western white pine	--	108.0	108.0
Lodgepole pine	33.3	375.9	409.2
Western larch	--	128.1	128.1
Western redcedar	--	364.0	364.0
Grand fir	--	844.8	844.8
Engelmann spruce-fir	--	251.4	251.4
Aspen	--	310.6	310.6
Cottonwood	--	78.8	78.8
Total timberland	34.5	4,853.1	4,887.6
Woodland:			
Pinyon-juniper	--	80.7	80.7
Juniper	--	368.7	368.7
Western juniper	--	161.4	161.4
Oak	--	(1)	(1)
Mountain brush	--	42.3	42.3
Riparian	--	69.9	69.9
Other hardwoods	--	95.4	95.4
Total woodland	--	818.4	818.4
Total forest land	34.5	5,671.5	5,706.0
Nonforest land			26,762.2
Total land area			32,468.2

[1]Less than 50 acres.

Table 68.--Cubic feet of net volume, net annual growth, and annual mortality in trees on other public and privately owned forest land in Idaho by species

Species	Net Volume 1981	Net annual growth 1980	Annual Mortality 1980
	- Million cubic feet -	- Thousand cubic feet -	
Douglas-fir	2,616.4	74,418	7,507
Ponderosa pine	944.1	29,806	3,384
Western white pine	420.5	4,949	5,193
Lodgepole pine	786.4	20,254	2,631
Whitebark pine	7.0	316	5
Limber pine	6.1	59	14
Western larch	644.0	13,869	2,887
Grand fir	1,653.4	55,258	6,676
Subalpine fir	211.7	9,346	962
Engelmann spruce	208.7	4,341	238
Western hemlock	325.5	9,719	734
Western redcedar	778.9	27,310	817
Aspen	225.7	13,162	1,642
Cottonwood	108.5	2,884	742
Total timberland species	8,936.9	265,691	33,432
Pinyon/juniper	298.2	5,100	99
Woodland hardwoods	113.3	2,560	140
Total woodland species	411.5	7,660	239
Total all species	9,348.4	273,351	33,671

Table 69.--Area of other public and privately owned timberland in Idaho by forest type and stand-size class, 1981

Forest type	Stand-size class				
	Sawtimber	Poletimber	Sapling and seedling	Nonstocked	Total
	- - - - - - - - - - - - Thousand acres - - - - - - - - - - - -				
Douglas-fir	1,054.1	123.5	127.8	182.9	1,488.3
Hemlock	122.6	16.4	9.7	4.6	153.3
Ponderosa pine	489.4	48.1	54.1	158.3	749.9
Western white pine	79.3	13.0	4.7	11.0	108.0
Lodgepole pine	178.8	117.7	52.8	26.6	375.9
Western larch	82.5	39.8	3.0	2.8	128.1
Western redcedar	248.5	18.4	75.2	21.9	364.0
Grand fir	680.4	28.5	103.8	32.1	844.8
Engelmann spruce-fir	169.1	27.6	38.8	15.9	251.4
Aspen	21.6	122.2	159.5	7.3	310.6
Cottonwood	47.5	8.8	--	22.5	78.8
All types	3,173.8	564.0	629.4	485.9	4,853.1

Table 70.--Area of other public and privately owned timberland in Idaho by stand volume and ownership class, 1981

Stand volume per acre[1]	Ownership class			Total
	Other public	Forest industry	Nonindustrial private	
	- - - - - - - - - - Thousand acres - - - - - - - - - -			
Less than 1,500 board feet	453.5	216.3	570.9	1,240.7
1,500 to 4,999 board feet	345.0	281.0	458.0	1,084.0
5,000 to 9,999 board feet	309.7	326.9	513.8	1,150.4
10,000 board feet or more	526.8	353.9	497.3	1,378.0
All classes	1,635.0	1,178.1	2,040.0	4,853.1

[1]International ¼-inch rule.

Table 71.--Area of other public and privately owned timberland in Idaho by forest type and area condition class, 1981

Forest type	Area condition class									Nonstocked	All classes
	10	20	30	40	50	60	70	80	90		
	Thousand acres										
Douglas-fir	1.3	2.0	77.9	104.6	122.1	403.1	406.0	71.9	116.5	182.9	1,488.3
Hemlock	--	--	14.5	0.5	41.9	25.1	9.6	13.2	43.9	4.6	153.3
Ponderosa pine	--	--	--	6.0	51.5	199.5	296.8	3.0	34.8	158.3	749.9
Western white pine	--	--	--	2.2	29.8	18.9	14.0	--	32.1	11.0	108.0
Lodgepole pine	7.0	0.6	1.0	55.2	131.4	84.4	46.6	--	23.1	26.6	375.9
Western larch	2.0	11.7	--	9.6	45.0	22.4	3.8	6.1	24.7	2.8	128.1
Western redcedar	--	--	15.2	17.0	77.7	56.5	84.1	13.7	77.9	21.9	364.0
Grand fir	24.1	53.3	14.1	151.9	219.2	123.8	102.7	30.1	93.5	32.1	844.8
Engelmann spruce-fir	--	2.0	7.1	30.5	28.4	45.0	35.4	40.3	46.8	15.9	251.4
Aspen	--	--	--	10.2	138.9	69.6	79.7	--	4.9	7.3	310.6
Cottonwood	--	--	--	--	7.9	24.8	23.6	--	--	22.5	78.8
All types	34.4	69.6	129.8	387.7	893.8	1,073.1	1,102.3	178.3	498.2	485.9	4,853.1

Table 72.--Number of growing-stock trees on other public and privately owned timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)															
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand trees															
Douglas-fir	74,820	60,396	51,801	36,786	31,262	20,006	14,319	8,830	5,710	3,596	1,692	1,132	659	305	450	311,764
Ponderosa pine	10,529	17,451	14,528	10,711	7,209	7,309	4,255	3,484	1,784	1,699	881	610	335	179	384	81,348
Western white pine	10,376	2,902	2,927	1,075	1,986	1,491	1,318	576	646	402	239	169	153	64	208	24,532
Lodgepole pine	43,230	19,873	29,734	23,083	11,212	6,667	1,940	664	137	100	41	3	--	--	1	136,685
Whitebark pine	1,353	737	524	175	184	67	32	10	18	5	3	2	--	2	1	3,113
Limber pine	1,078	85	64	249	128	21	62	3	2	6	3	--	1	2	--	1,704
Western larch	11,657	16,367	18,737	12,207	6,972	4,032	2,625	1,581	798	473	268	173	93	67	103	76,153
Grand fir	130,413	77,519	39,509	21,390	16,014	9,133	6,467	4,093	2,311	1,408	655	494	397	232	567	310,602
Subalpine fir	15,178	9,498	7,806	5,846	2,401	2,500	1,016	583	196	146	73	22	56	8	5	45,334
White fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Engelmann spruce	10,512	5,069	3,167	2,114	1,234	800	575	411	253	168	254	150	90	58	105	24,960
Western hemlock	43,950	18,609	10,706	4,976	3,213	2,341	1,402	793	600	359	208	109	84	60	73	87,483
Western redcedar	104,297	32,253	19,449	10,706	8,136	4,413	3,228	2,502	1,406	1,039	811	400	256	239	808	189,943
Total softwoods	457,393	260,759	198,952	129,318	89,951	58,780	37,239	23,530	13,861	9,401	5,128	3,264	2,124	1,216	2,705	1,293,621
Aspen	55,823	33,534	35,542	12,153	3,473	1,395	248	134	65	40	19	2	--	1	--	142,429
Cottonwood	2,560	879	1,056	240	630	808	561	426	365	150	178	146	51	29	122	8,201
Total hardwoods	58,383	34,413	36,598	12,393	4,103	2,203	809	560	430	190	197	148	51	30	122	150,630
All species	515,776	295,172	235,550	141,711	94,054	60,983	38,048	24,090	14,291	9,591	5,325	3,412	2,175	1,246	2,827	1,444,251

Table 73.--Number of cull and salvable dead trees on other public and privately owned timberland in Idaho by ownership class, and softwoods and hardwoods, 1981

Ownership class and species group	Cull trees			Salvable dead trees	All dead trees
	Sound	Rotten	Total		
	- - - - - - - - - - - - Thousand trees - - - - - - - - - - - -				
Other public:					
Softwoods	6,215	2,634	8,849	3,030	11,879
Hardwoods	30	2,315	2,345	698	3,043
Total	6,245	4,949	11,194	3,728	14,922
Forest industry:					
Softwoods	359	2,881	3,240	16,181	19,421
Hardwoods	--	--	--	47	47
Total	359	2,881	3,240	16,228	19,468
Nonindustrial private:					
Softwoods	--	2,526	2,526	18,412	20,938
Hardwoods	--	2,483	2,483	6,384	8,867
Total	--	5,009	5,009	24,796	29,805
Total:					
Softwoods	6,574	8,041	14,615	37,623	52,238
Hardwoods	30	4,798	4,828	7,129	11,957
Total	6,604	12,839	19,443	44,752	64,195

Table 74.--Net volume of growing stock on other public and privately owned timberland in Idaho by ownership class, forest type, and stand-size class, 1981

Ownership class	Forest type	Stand-size class				
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked	All classes
		Million cubic feet				
Other public:						
	Douglas-fir	713.6	82.9	13.7	5.0	815.2
	Hemlock	172.1	6.0	3.2	0.1	181.4
	Ponderosa pine	323.7	20.4	7.0	9.0	360.1
	Western white pine	349.8	10.3	2.9	0.9	363.9
	Lodgepole pine	138.5	115.2	6.4	1.0	261.1
	Western larch	71.1	59.4	5.0	0.5	136.0
	Western redcedar	290.0	11.0	8.0	2.2	311.2
	Grand fir	556.2	7.8	4.0	3.1	571.1
	Engelmann spruce-fir	198.1	28.7	4.1	1.0	231.9
	Aspen	31.6	69.2	22.5	1.1	124.4
	Cottonwood	6.4	1.1	--	1.0	8.5
	All types	2,851.1	412.0	76.8	24.9	3,364.8
Forest industry:						
	Douglas-fir	453.7	53.5	9.5	2.1	518.8
	Hemlock	129.3	11.2	--	--	140.5
	Ponderosa pine	66.0	10.2	15.1	1.7	93.0
	Western white pine	--	--	--	--	--
	Lodgepole pine	90.6	51.6	--	--	142.2
	Western larch	110.2	--	--	--	110.2
	Western redcedar	326.8	6.1	38.5	--	371.4
	Grand fir	714.5	1.8	11.6	--	727.9
	Engelmann spruce-fir	124.4	13.3	18.6	[1]	156.3
	Aspen	--	[1]	[1]	--	[1]
	Cottonwood	24.2	[1]	--	[1]	24.2
	All types	2,039.7	147.7	93.3	3.8	2,284.5
Nonindustrial private:						
	Douglas-fir	1,134.6	76.9	40.3	4.1	1,255.9
	Hemlock	17.3	5.3	1.5	--	24.1
	Ponderosa pine	458.2	12.6	8.9	15.6	495.3
	Western white pine	62.3	0.5	--	--	62.8
	Lodgepole pine	196.8	154.7	22.0	1.2	374.7
	Western larch	105.1	44.8	--	--	149.9
	Western redcedar	247.2	--	--	--	247.2
	Grand fir	398.1	20.6	9.8	--	428.5
	Engelmann spruce-fir	70.1	3.3	--	3.0	76.4
	Aspen	--	73.7	21.2	--	94.9
	Cottonwood	63.4	2.5	--	5.7	71.6
	All types	2,753.1	394.9	103.7	29.6	3,281.3
Total:						
	Douglas-fir	2,301.9	213.3	63.5	11.2	2,589.9
	Hemlock	318.7	22.5	4.7	0.1	346.0
	Ponderosa pine	847.9	43.2	31.0	26.3	948.4
	Western white pine	412.1	10.8	2.9	0.9	426.7
	Lodgepole pine	425.9	321.5	28.4	2.2	778.0
	Western larch	286.4	104.2	5.0	0.5	396.1
	Western redcedar	864.0	17.1	46.5	2.2	929.8
	Grand fir	1,668.8	30.2	25.4	3.1	1,727.5
	Engelmann spruce-fir	392.6	45.3	22.7	4.0	464.6
	Aspen	31.6	142.9	43.7	1.1	219.3
	Cottonwood	94.0	3.6	--	6.7	104.3
	All types	7,643.9	954.6	273.8	58.3	8,930.6

[1]Less than 0.05 million cubic feet.

Table 75.--Net volume of sawtimber (International ¼-inch rule) on other public and privately owned timberland in Idaho by ownership class, forest type, and stand-size class, 1981

Ownership class	Forest type	Stand-size class				
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked	All classes
		- - - - - Million board feet, International ¼-inch rule - - - - -				
Other public:						
	Douglas-fir	3,228.1	129.3	49.4	23.8	3,430.6
	Hemlock	879.5	12.6	11.8	--	903.9
	Ponderosa pine	1,761.2	29.9	31.3	54.6	1,877.0
	Western white pine	2,013.5	18.9	6.6	6.3	2,045.3
	Lodgepole pine	571.0	156.3	13.3	6.0	746.6
	Western larch	370.5	91.6	11.6	2.7	476.4
	Western redcedar	1,508.9	17.4	12.2	9.1	1,547.6
	Grand fir	2,910.1	9.2	14.4	4.7	2,938.4
	Engelmann spruce-fir	959.5	54.7	9.4	5.7	1,029.3
	Aspen	140.2	71.5	39.5	6.7	257.9
	Cottonwood	31.3	1.4	--	4.7	37.4
	All types	14,373.8	592.8	199.5	124.3	15,290.4
Forest industry:						
	Douglas-fir	2,220.0	118.1	27.3	6.7	2,372.1
	Hemlock	493.1	27.7	--	--	520.8
	Ponderosa pine	306.2	23.7	59.4	4.9	394.2
	Western white pine	--	--	--	--	--
	Lodgepole pine	304.9	65.5	--	--	370.4
	Western larch	522.6	--	--	--	522.6
	Western redcedar	1,540.9	--	130.2	--	1,671.1
	Grand fir	3,051.0	--	30.1	--	3,081.1
	Engelmann spruce-fir	611.5	28.3	69.9	(1)	709.7
	Aspen	--	--	--	--	--
	Cottonwood	130.6	(1)	--	0.1	130.7
	All types	9,180.8	263.3	316.9	11.7	9,772.7
Nonindustrial private:						
	Douglas-fir	5,032.9	163.0	153.9	14.0	5,363.8
	Hemlock	72.1	6.1	--	--	78.2
	Ponderosa pine	2,227.9	22.4	40.2	78.0	2,368.5
	Western white pine	340.5	--	--	--	340.5
	Lodgepole pine	705.4	232.9	87.6	--	1,025.9
	Western larch	535.6	84.2	--	--	619.8
	Western redcedar	1,046.0	--	--	--	1,046.0
	Grand fir	1,655.8	36.0	26.0	--	1,717.8
	Engelmann spruce-fir	276.1	3.0	--	15.7	294.8
	Aspen	--	41.5	43.3	--	84.8
	Cottonwood	307.6	3.2	--	26.8	337.6
	All types	12,199.9	592.3	351.0	134.5	13,277.7
Total:						
	Douglas-fir	10,481.0	410.4	230.6	44.5	11,166.5
	Hemlock	1,444.7	46.4	11.8	--	1,502.9
	Ponderosa pine	4,295.3	76.0	130.9	137.5	4,639.7
	Western white pine	2,354.0	18.9	6.6	6.3	2,385.8
	Lodgepole pine	1,581.3	454.7	100.9	6.0	2,142.9
	Western larch	1,428.7	175.8	11.6	2.7	1,618.8
	Western redcedar	4,095.8	17.4	142.4	9.1	4,264.7
	Grand fir	7,616.9	45.2	70.5	4.7	7,737.3
	Engelmann spruce-fir	1,847.1	86.0	79.3	21.4	2,033.8
	Aspen	140.2	113.0	82.8	6.7	342.7
	Cottonwood	469.5	4.6	--	31.6	505.7
	All types	35,754.5	1,448.4	867.4	270.5	38,340.8

[1]Less than 0.05 million board feet.

Table 76.--Net volume of sawtimber (Scribner rule) on other public and privately owned timberland in Idaho by ownership class, forest type, and stand-size class, 1981

Ownership class	Forest type	Stand-size class				
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked	All classes
		Million board feet, Scribner rule				
Other public:						
	Douglas-fir	2,719.6	104.4	41.6	19.4	2,885.0
	Hemlock	758.1	10.6	10.1	--	778.8
	Ponderosa pine	1,492.4	24.0	26.2	46.8	1,589.4
	Western white pine	1,753.8	16.0	5.0	5.6	1,780.4
	Lodgepole pine	480.7	131.0	11.4	5.3	628.4
	Western larch	308.5	73.0	9.1	1.9	392.5
	Western redcedar	1,290.6	14.3	10.2	7.5	1,322.6
	Grand fir	2,513.1	7.4	12.1	3.8	2,536.4
	Engelmann spruce-fir	822.1	45.7	7.7	4.9	880.4
	Aspen	117.8	58.7	31.8	6.0	214.3
	Cottonwood	27.1	1.2	--	4.2	32.5
	All types	12,283.8	486.3	165.2	105.4	13,040.7
Forest industry:						
	Douglas-fir	1,886.1	92.8	23.4	5.4	2,007.7
	Hemlock	415.6	22.9	--	--	438.5
	Ponderosa pine	253.8	17.9	46.8	3.8	322.3
	Western white pine	--	--	--	--	--
	Lodgepole pine	255.2	54.2	--	--	309.4
	Western larch	429.6	--	--	--	429.6
	Western redcedar	1,316.7	--	107.4	--	1,424.1
	Grand fir	2,603.2	--	23.9	--	2,627.1
	Engelmann spruce-fir	525.9	23.1	58.0	[1]	607.0
	Aspen	--	--	--	--	--
	Cottonwood	115.1	[1]	--	0.1	115.2
	All types	7,801.2	210.9	259.5	9.3	8,280.9
Nonindustrial private:						
	Douglas-fir	4,232.8	133.4	126.4	10.3	4,502.9
	Hemlock	57.4	4.3	--	--	61.7
	Ponderosa pine	1,833.3	17.3	33.3	63.8	1,947.7
	Western white pine	290.5	--	--	--	290.5
	Lodgepole pine	584.0	196.4	71.8	--	852.2
	Western larch	447.4	68.7	--	--	516.1
	Western redcedar	870.1	--	--	--	870.1
	Grand fir	1,403.0	29.3	20.2	--	1,452.5
	Engelmann spruce-fir	236.5	2.7	--	13.4	252.6
	Aspen	--	33.2	37.7	--	70.9
	Cottonwood	265.2	2.6	--	23.4	291.2
	All types	10,220.2	487.9	289.4	110.9	11,108.4
Total:						
	Douglas-fir	8,838.5	330.6	191.4	35.1	9,395.6
	Hemlock	1,231.1	37.8	10.1	--	1,279.0
	Ponderosa pine	3,579.5	59.2	106.3	114.4	3,859.4
	Western white pine	2,044.3	16.0	5.0	5.6	2,070.9
	Lodgepole pine	1,319.9	381.6	83.2	5.3	1,790.0
	Western larch	1,185.5	141.7	9.1	1.9	1,338.2
	Western redcedar	3,477.4	14.3	117.6	7.5	3,616.8
	Grand fir	6,519.3	36.7	56.2	3.8	6,616.0
	Engelmann spruce-fir	1,584.5	71.5	65.7	18.3	1,740.0
	Aspen	117.8	91.9	69.5	6.0	285.2
	Cottonwood	407.4	3.8	--	27.7	438.9
	All types	30,305.2	1,185.1	714.1	225.6	32,430.0

[1]Less than 0.05 million board feet.

Table 77.--Net volume of timber on other public and privately owned timberland in Idaho by class of timber, and softwoods and hardwoods, 1981

Class of timber	Softwoods	Hardwoods	All classes
	- - - - - - - - Million cubic feet - - - - - - - -		
Sawtimber trees:			
Saw-log portion	6,301.8	107.1	6,408.9
Upper-stem portion	768.4	30.3	798.7
Total	7,070.2	137.4	7,207.6
Poletimber trees	1,527.0	196.0	1,723.0
All growing stock trees	8,597.2	333.4	8,930.6
Sound cull trees	46.3	0.1	46.4
Rotten cull trees	58.3	7.9	66.2
Salvable dead trees	351.8	21.8	373.6
All timber	9,053.6	363.2	9,416.8

Table 78.--Net volume of growing stock on other public and privately owned timberland in Idaho by forest type and species, 1981

Forest type	Species								
	Douglas-fir	Ponderosa pine	Western white pine	Lodgepole pine	Whitebark pine	Limber pine	Western larch	Grand fir	Subalpine fir
	Million cubic feet								
Douglas-fir	1,862.2	194.4	28.7	64.0	0.5	1.0	126.4	177.4	17.5
Hemlock	24.0	1.2	15.7	4.7	--	--	28.7	25.7	3.7
Ponderosa pine	171.0	667.8	6.2	34.9	--	--	27.3	26.5	0.4
Western white pine	31.5	2.0	192.3	10.2	--	0.2	30.1	88.0	2.1
Lodgepole pine	79.8	21.7	4.5	583.2	0.8	0.1	40.8	18.5	2.9
Western larch	46.1	8.9	26.6	10.5	--	0.1	227.0	26.3	1.3
Western redcedar	67.4	4.2	58.3	24.6	--	--	69.0	206.0	2.4
Grand fir	231.2	27.9	81.4	27.7	--	--	75.8	1,073.8	8.2
Engelmann spruce-fir	50.3	0.4	6.8	21.0	5.7	4.7	18.9	11.2	172.7
Aspen	45.5	4.7	--	5.6	--	--	--	([1])	0.5
Cottonwood	2.3	10.9	--	--	--	--	--	--	--
All types	2,611.3	944.1	420.5	786.4	7.0	6.1	644.0	1,653.4	211.7

(con.)

Table 78 (con.)

Forest type	Species							
	Engelmann spruce	Western hemlock	Western redcedar	Total Softwoods	Aspen	Cottonwood	Total hardwoods	All species
	Million cubic feet							
Douglas-fir	8.0	9.0	63.9	2,553.0	31.9	5.0	36.9	2,589.9
Hemlock	7.4	181.3	50.2	342.6	1.9	1.5	3.4	346.0
Ponderosa pine	2.6	1.3	4.2	942.2	5.1	1.1	6.2	948.4
Western white pine	7.3	5.3	55.6	424.6	2.1	--	2.1	426.7
Lodgepole pine	5.9	2.6	10.8	771.6	6.4	--	6.4	778.0
Western larch	5.3	10.4	28.0	390.5	0.4	5.2	5.6	396.1
Western redcedar	8.4	55.4	426.1	921.8	2.5	5.5	8.0	929.8
Grand fir	17.2	42.3	133.3	1,718.8	2.0	6.7	8.7	1,727.5
Engelmann spruce-fir	146.2	17.9	6.2	462.0	2.6	--	2.6	464.6
Aspen	0.4	--	0.2	56.9	162.4	--	162.4	219.3
Cottonwood	--	--	--	13.2	8.2	82.9	91.1	104.3
All types	208.7	325.5	778.5	8,597.2	225.5	107.9	333.4	8,930.6

[1]Less than 0.05 million cubic feet.

Table 79.--Net volume of sawtimber (International ¼-inch rule) on other public and privately owned timberland in Idaho by forest type and species, 1981

Forest type	Species								
	Douglas-fir	Ponderosa pine	Western white pine	Lodgepole pine	Whitebark pine	Limber pine	Western larch	Grand fir	Subalpine fir
	Million board feet, International ¼-inch rule								
Douglas-fir	8,209.8	1,040.2	148.3	217.6	2.0	3.3	464.3	746.0	42.3
Hemlock	97.1	6.5	83.9	22.6	--	--	131.4	93.3	18.6
Ponderosa pine	787.0	3,424.4	33.4	146.6	--	--	92.6	117.3	0.5
Western white pine	169.1	12.2	1,101.5	53.4	--	1.1	184.4	497.5	10.7
Lodgepole pine	315.2	98.4	17.8	1,411.8	1.6	--	191.9	39.1	7.2
Western larch	205.3	52.6	150.4	30.6	--	0.2	923.5	90.0	5.3
Western redcedar	321.7	23.6	342.7	116.6	--	--	362.5	922.1	12.6
Grand fir	1,095.9	140.5	415.9	96.4	--	--	357.9	4,769.6	30.9
Engelmann spruce-fir	263.4	2.7	36.3	82.1	18.7	13.3	113.5	51.8	602.6
Aspen	184.4	28.8	--	28.2	--	--	--	0.1	1.6
Cottonwood	12.8	67.5	--	--	--	--	--	--	--
All types	11,661.7	4,897.4	2,330.2	2,205.9	22.3	17.9	2,822.0	7,326.8	732.3

(con.)

Table 79 (con.)

Forest type	Species							All species
	Engelmann spruce	Western hemlock	Western redcedar	Total Softwoods	Aspen	Cottonwood	Total hardwoods	
	Million board feet, International ¼-inch rule							
Douglas-fir	37.8	13.3	217.5	11,142.4	13.2	10.9	24.1	11,166.5
Hemlock	43.0	787.6	210.7	1,494.7	1.3	6.9	8.2	1,502.9
Ponderosa pine	11.3	6.2	20.4	4,639.7	--	--	--	4,639.7
Western white pine	40.6	22.5	284.9	2,377.8	7.9	--	7.9	2,385.8
Lodgepole pine	14.2	9.5	22.1	2,128.9	14.1	--	14.1	2,142.9
Western larch	28.5	44.8	67.1	1,598.3	1.6	18.9	20.5	1,618.8
Western redcedar	43.2	242.2	1,846.0	4,233.2	5.5	26.0	31.5	4,264.7
Grand fir	88.8	194.3	507.4	7,697.6	6.6	33.1	39.7	7,737.3
Engelmann spruce-fir	729.3	84.6	28.8	2,027.1	6.7	--	6.7	2,033.8
Aspen	1.9	--	1.0	246.0	96.7	--	96.7	342.7
Cottonwood	--	--	--	80.3	42.3	383.1	425.4	505.7
All types	1,038.6	1,405.0	3,205.9	37,666.0	195.9	478.9	674.8	38,340.8

Table 80.--Net volume of sawtimber (Scribner rule) on other public and privately owned timberland in Idaho by forest type and species, 1981

Forest type	Species								
	Douglas-fir	Ponderosa pine	Western white pine	Lodgepole pine	Whitebark pine	Limber pine	Western larch	Grand fir	Subalpine fir
	Million board feet, Scribner rule								
Douglas-fir	6,924.0	881.6	128.6	183.2	1.7	2.7	364.5	639.1	35.7
Hemlock	82.9	5.6	72.5	19.3	--	--	106.7	80.9	15.4
Ponderosa pine	667.5	2,836.8	28.3	124.4	--	--	71.3	98.8	0.4
Western white pine	147.1	10.3	964.8	45.3	--	1.0	155.2	437.3	9.1
Lodgepole pine	264.7	80.6	15.1	1,184.0	1.2	--	154.4	33.9	6.1
Western larch	173.5	44.8	129.7	25.6	--	0.2	749.0	76.6	4.4
Western redcedar	276.5	19.5	303.8	99.2	--	--	299.1	806.2	10.9
Grand fir	937.1	115.4	363.3	83.5	--	--	298.9	4,105.7	24.8
Engelmann spruce-fir	225.9	2.4	32.0	70.1	15.3	11.4	95.7	44.9	506.7
Aspen	154.2	25.1	--	24.7	--	--	--	0.1	1.3
Cottonwood	11.0	59.3	--	--	--	--	--	--	--
All types	9,864.4	4,081.4	2,038.1	1,859.3	18.2	15.3	2,294.8	6,323.5	614.8

(con.)

Table 80 (con.)

Forest type	Species							All species
	Engelmann spruce	Western hemlock	Western redcedar	Total Softwoods	Aspen	Cottonwood	Total hardwoods	
	Million board feet, Scribner rule							
Douglas-fir	32.5	11.0	170.1	9,374.7	11.1	9.8	20.9	9,395.6
Hemlock	37.8	680.9	169.8	1,271.8	1.1	6.1	7.2	1,279.0
Ponderosa pine	9.9	4.8	17.2	3,859.4	--	--	--	3,859.4
Western white pine	35.2	19.7	239.0	2,064.0	6.9	--	6.9	2,070.9
Lodgepole pine	12.2	7.4	17.9	1,777.5	12.5	--	12.5	1,790.0
Western larch	24.8	38.0	53.5	1,320.1	1.4	16.7	18.1	1,338.2
Western redcedar	37.6	210.3	1,525.9	3,589.0	4.9	22.9	27.8	3,616.8
Grand fir	75.9	166.1	410.4	6,581.1	5.8	29.1	34.9	6,616.0
Engelmann spruce-fir	636.1	70.9	22.9	1,734.3	5.7	--	5.7	1,740.0
Aspen	1.6	--	0.7	207.7	77.5	--	77.5	285.2
Cottonwood	--	--	--	70.3	36.2	332.4	368.6	438.9
All types	903.6	1,209.1	2,627.4	31,849.9	163.1	417.0	580.1	32,430.0

Table 81.--Net volume of growing stock and sawtimber on other public and privately owned timberland in Idaho by species, 1981

Species	Growing stock	Sawtimber	
		International ¼-inch rule	Scribner rule
	- Million cubic feet -	- Million board feet -	
Douglas-fir	2,611.3	11,661.7	9,864.4
Ponderosa pine	944.1	4,897.4	4,081.4
Western white pine	420.5	2,330.2	2,038.1
Lodgepole pine	786.4	2,205.9	1,859.3
Whitebark pine	7.0	22.3	18.2
Limber pine	6.1	17.9	15.3
Western larch	644.0	2,822.0	2,294.8
Grand fir	1,653.4	7,326.8	6,323.5
Subalpine fir	211.7	732.3	614.8
Engelmann spruce	208.7	1,038.6	903.6
Western hemlock	325.5	1,405.0	1,209.1
Western redcedar	778.5	3,205.9	2,627.4
Total softwoods	8,597.2	37,666.0	31,849.9
Aspen	225.5	195.9	163.1
Cottonwood	107.9	478.9	417.0
Total hardwoods	333.4	674.8	580.1
All species	8,930.6	38,340.8	32,430.0

Table 82.--Net volume of growing stock on other public and privately owned timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million cubic feet													
Douglas-fir	156.9	228.3	330.1	346.9	364.8	306.6	257.6	203.4	120.7	97.9	70.1	38.3	89.7	2,611.3
Ponderosa pine	20.9	47.3	61.7	114.9	103.9	116.2	86.2	99.6	67.7	60.6	40.8	28.8	95.5	944.1
Western white pine	13.0	7.4	30.3	37.5	48.4	30.5	44.6	36.8	26.9	23.0	25.1	12.9	84.1	420.5
Lodgepole pine	152.3	211.8	165.8	151.2	59.0	29.7	6.8	6.2	3.2	0.2	--	--	0.2	786.4
Whitebark pine	1.5	1.0	1.6	0.9	0.6	0.3	0.5	0.2	0.1	0.1	--	0.1	0.1	7.0
Limber pine	0.2	2.1	1.4	0.2	1.6	0.1	0.1	0.2	0.1	--	([1])	0.1	--	6.1
Western larch	64.6	89.5	94.0	86.6	79.1	65.1	45.0	35.3	21.8	18.2	12.1	9.7	23.0	644.0
Grand fir	109.0	139.6	202.5	195.0	211.3	178.9	139.3	110.3	65.4	53.5	55.7	39.7	153.2	1,653.4
Subalpine fir	29.1	40.5	26.1	43.7	23.5	20.4	8.0	7.7	4.7	1.7	4.9	0.8	0.6	211.7
Engelmann spruce	10.9	14.3	16.0	16.5	17.9	16.5	15.5	13.2	24.7	16.7	12.8	9.7	24.0	208.7
Western hemlock	23.4	33.9	39.6	46.2	40.4	31.6	31.5	23.1	17.2	9.4	9.0	8.2	12.0	325.5
Western redcedar	64.1	65.4	83.8	65.7	67.7	68.0	50.1	45.3	41.9	24.2	19.2	21.4	161.7	778.5
Total softwoods	645.9	881.1	1,052.9	1,105.3	1,018.2	863.9	685.2	581.3	394.4	305.5	249.7	169.7	644.1	8,597.2
Aspen	84.2	68.9	34.7	20.2	5.5	5.1	3.0	1.9	1.5	0.2	--	0.3	--	225.5
Cottonwood	1.6	0.5	6.1	13.4	12.5	13.2	13.7	6.8	10.0	8.7	3.3	3.3	14.8	107.9
Total hardwoods	85.8	69.4	40.8	33.6	18.0	18.3	16.7	8.7	11.5	8.9	3.3	3.6	14.8	333.4
All species	731.7	950.5	1,093.7	1,138.9	1,036.2	882.2	701.9	590.0	405.9	314.4	253.0	173.3	658.9	8,930.6

[1]Less than 0.05 million cubic feet

Table 83.--Net volume of sawtimber (International ¼-inch rule) on other public and privately owned timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, International ¼-inch rule											
Douglas-fir	1,229.2	1,731.5	1,945.5	1,691.1	1,449.3	1,158.7	697.6	571.4	414.6	229.7	543.1	11,661.7
Ponderosa pine	205.3	522.3	548.7	653.9	508.6	595.7	412.8	370.9	252.6	185.0	641.6	4,897.4
Western white pine	130.0	210.5	278.7	178.2	255.4	218.2	164.5	140.0	152.3	82.0	520.4	2,330.2
Lodgepole pine	724.8	879.3	341.2	168.7	38.3	33.7	17.6	1.2	--	--	1.1	2,205.9
Whitebark pine	6.5	5.1	3.3	1.4	2.9	1.0	0.5	0.5	--	0.7	0.4	22.3
Limber pine	3.9	1.2	9.2	0.4	0.3	1.6	0.5	--	0.3	0.5	--	17.9
Western larch	406.1	519.2	476.1	393.6	271.7	215.3	135.2	116.0	77.8	62.7	148.3	2,822.0
Grand fir	781.8	1,037.4	1,161.7	984.6	752.4	594.1	352.2	282.2	298.9	233.4	848.1	7,326.8
Subalpine for	104.8	231.1	126.4	110.6	43.4	42.6	26.9	10.1	28.1	4.4	3.9	732.3
Engelmann spruce	66.1	90.9	100.2	92.4	86.8	73.8	137.0	97.4	77.5	61.2	155.3	1,038.6
Western hemlock	154.6	230.9	213.5	174.0	174.3	128.5	100.4	54.1	53.3	49.4	72.0	1,405.0
Western redcedar	317.8	331.4	346.7	347.7	255.4	230.1	210.5	123.9	102.1	115.2	825.1	3,205.9
Total softwoods	4,130.9	5,790.8	5,551.2	4,796.6	3,838.8	3,293.3	2,255.7	1,767.7	1,457.5	1,024.2	3,759.3	37,666.0
Aspen	XXXXXXX	104.9	29.5	26.2	15.6	9.4	7.4	1.3	--	1.6	--	195.9
Cottonwood	XXXXXXX	69.0	63.6	65.6	66.0	31.9	45.8	39.0	14.5	15.0	68.5	478.9
Total hardwoods	XXXXXXX	173.9	93.1	91.8	81.6	41.3	53.2	40.3	14.5	16.6	68.5	674.8
All species	4,130.9	5,964.7	5,644.3	4,888.4	3,920.4	3,334.6	2,308.9	1,808.0	1,472.0	1,040.8	3,827.8	38,340.8

Table 84.--Net volume of sawtimber (Scribner rule) on other public and privately owned timberland in Idaho by species and diameter class, 1981

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Million board feet, Scribner rule											
Douglas-fir	956.4	1,382.0	1,625.8	1,445.7	1,255.8	1,012.5	620.9	508.5	369.0	204.4	483.4	9,864.4
Ponderosa pine	135.2	391.5	441.9	541.8	430.1	507.7	354.5	322.0	221.5	164.3	570.9	4,081.4
Western white pine	106.7	174.1	238.9	156.1	226.1	194.2	145.7	124.6	135.6	73.0	463.1	2,038.1
Lodgepole pine	604.0	732.5	292.2	149.0	34.0	30.0	15.6	1.0	--	--	1.0	1,859.3
Whitebark pine	5.2	3.9	2.7	1.1	2.4	0.9	0.4	0.5	--	0.7	0.4	18.2
Limber pine	3.5	0.9	7.8	0.3	0.3	1.4	0.5	--	0.2	0.4	--	15.3
Western larch	302.3	385.5	378.7	327.2	233.3	188.6	119.2	103.1	69.2	55.8	131.9	2,294.8
Grand fir	633.3	852.2	994.7	858.2	664.2	527.7	313.4	251.1	266.1	207.7	754.9	6,323.5
Subalpine fir	85.6	187.2	105.9	95.6	37.8	37.5	23.9	9.0	25.0	3.9	3.4	614.8
Engelmann spruce	54.2	74.4	84.7	79.4	75.7	64.9	121.9	86.7	69.0	54.5	138.2	903.6
Western hemlock	122.0	188.1	183.7	153.8	155.1	114.4	88.5	48.0	47.5	43.9	64.1	1,209.1
Western redcedar	256.3	253.7	268.9	271.1	201.0	184.2	172.5	103.7	86.8	99.2	730.0	2,627.4
Total softwoods	3,264.7	4,626.0	4,625.9	4,079.3	3,315.8	2,864.0	1,977.0	1,558.2	1,289.9	907.8	3,341.3	31,849.9
Aspen	XXXXXXX	83.7	24.9	23.1	13.9	8.3	6.6	1.2	--	1.4	--	163.1
Cottonwood	XXXXXXX	57.2	54.2	57.0	57.9	28.2	40.6	34.7	12.9	13.4	60.9	417.0
Total hardwoods	XXXXXXX	140.9	79.1	80.1	71.8	36.5	47.2	35.9	12.9	14.8	60.9	580.1
All species	3,264.7	4,766.9	4,705.0	4,159.4	3,387.6	2,900.5	2,024.2	1,594.1	1,302.8	922.6	3,402.2	32,430.0

Table 85.--Net annual growth of growing stock and sawtimber on other public and privately owned timberland in Idaho by species, 1980

Species	Growing stock	Sawtimber	
		International ¼-inch rule	Scribner rule
	- Thousand cubic feet -	- Thousand board feet -	
Douglas-fir	74,272	360,233	323,628
Ponderosa pine	29,806	155,831	134,443
Western white pine	4,949	37,608	34,851
Lodgepole pine	20,254	67,247	61,693
Whitebark pine	316	152	142
Limber pine	58	284	259
Western larch	13,869	45,282	41,596
Grand fir	55,258	234,474	210,408
Subalpine fir	9,346	15,930	14,882
Engelmann spruce	4,341	18,451	16,596
Western hemlock	9,719	37,426	34,328
Western redcedar	27,290	70,151	60,354
Total softwoods	249,478	1,043,069	933,180
Aspen	13,158	16,728	13,278
Cottonwood	2,862	10,308	9,609
Total hardwoods	16,020	27,036	22,887
All species	265,498	1,070,105	956,067

Table 86.--Net annual growth of growing stock on other public and privately owned timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand cubic feet													
Douglas-fir	11,765	8,717	11,641	11,167	10,243	7,904	5,247	3,552	1,824	944	706	324	238	74,272
Ponderosa pine	3,993	2,678	2,896	4,074	3,716	2,939	2,359	2,479	1,723	782	822	391	954	29,806
Western white pine	114	-545	1,410	801	741	577	800	376	360	138	81	-316	412	4,949
Lodgepole pine	6,244	5,727	3,974	3,453	435	462	-172	112	33	2	-18	--	2	20,254
Whitebark pine	273	12	12	8	2	1	5	1	([1])	1	--	1	([1])	316
Limber pine	2	41	14	1	8	-13	([1])	3	1	--	([1])	1	--	58
Western larch	4,748	2,341	1,892	1,803	1,625	659	551	333	220	-511	106	-1	103	13,869
Grand fir	13,458	6,436	7,846	6,612	6,882	4,537	2,973	1,988	1,152	600	828	460	1,486	55,258
Subalpine fir	6,104	1,058	494	493	544	369	95	121	8	-2	48	7	7	9,346
Engelmann spruce	635	565	570	528	435	359	199	235	215	155	137	103	205	4,341
Western hemlock	2,050	1,583	1,346	1,303	1,152	684	626	426	275	123	110	60	-19	9,719
Western redcedar	13,605	2,124	2,912	1,666	1,804	1,562	830	645	425	110	186	245	1,176	27,290
Total softwoods	62,991	30,737	35,007	31,909	27,587	20,040	13,513	10,271	6,236	2,342	3,006	1,275	4,564	249,478
Aspen	9,269	1,921	1,030	476	157	155	69	31	43	4	--	3	--	13,158
Cottonwood	270	71	250	642	411	-127	442	-16	233	252	83	50	301	2,862
Total hardwoods	9,539	1,992	1,280	1,118	568	28	511	15	276	256	83	53	301	16,020
All species	72,530	32,729	36,287	33,027	28,155	20,068	14,024	10,286	6,512	2,598	3,089	1,328	4,865	265,498

[1]Less than 0.05 thousand cubic feet

Table 87.--Net annual growth of sawtimber (International ¼-inch rule) on other public and privately owned timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	102,862	68,796	62,781	47,725	31,687	21,268	10,982	5,962	4,472	2,039	1,659	360,233
Ponderosa pine	21,246	27,498	25,035	20,163	15,369	15,820	10,868	4,869	5,170	2,830	6,963	155,831
Western white pine	13,523	5,312	4,534	3,314	4,327	2,275	2,292	855	495	-1,848	2,529	37,608
Lodgepole pine	42,627	20,050	2,343	2,465	-960	612	192	14	-105	--	9	67,247
Whitebark pine	50	47	8	8	24	6	2	3	--	3	1	152
Limber pine	279	6	41	-75	2	20	5	--	2	4	--	284
Western larch	14,993	11,117	9,890	4,024	3,352	2,278	1,445	-3,134	666	-23	674	45,282
Grand fir	81,940	40,914	38,952	24,066	14,195	10,128	5,877	3,125	4,356	2,725	8,196	234,474
Subalpine for	6,225	2,909	3,024	2,022	535	724	99	-2	309	43	42	15,930
Engelmann spruce	3,082	2,930	2,415	1,947	1,084	1,347	1,438	1,103	973	721	1,411	18,451
Western hemlock	8,996	8,198	6,730	4,007	3,623	2,479	1,688	751	686	384	-116	37,426
Western redcedar	25,697	9,085	9,330	7,680	4,142	3,101	2,062	632	1,004	1,321	6,097	70,151
Total softwoods	321,520	196,862	165,083	117,346	77,380	60,058	36,950	14,178	18,028	8,199	27,465	1,043,069
Aspen	XXXXXXX	14,394	849	770	342	135	200	22	--	16	--	16,728
Cottonwood	XXXXXXX	3,279	1,979	-829	1,867	-181	1,003	1,114	383	242	1,451	10,308
Total hardwoods	XXXXXXX	17,673	2,828	-59	2,209	-46	1,203	1,136	383	258	1,451	27,036
All species	321,520	214,535	167,911	117,287	79,589	60,012	38,153	15,314	18,411	8,457	28,916	1,070,105

Table 88.--Net annual growth of sawtimber (Scribner rule) on other public and privately owned timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Douglas-fir	90,836	62,280	57,058	43,184	28,719	19,200	9,774	5,307	3,980	1,814	1,476	323,628
Ponderosa pine	14,797	24,113	22,134	18,003	13,553	13,899	9,664	4,636	4,813	2,540	6,291	134,443
Western white pine	12,178	5,206	4,424	3,089	3,992	2,047	2,101	767	441	-1,645	2,251	34,851
Lodgepole pine	38,553	18,537	2,444	2,328	-812	545	170	13	-93	--	8	61,693
Whitebark pine	45	44	10	7	23	5	2	2	--	3	1	142
Limber pine	249	5	38	-63	2	18	5	--	1	4	--	259
Western larch	13,136	10,247	9,242	3,973	3,136	2,121	1,341	-2,773	593	-20	600	41,596
Grand fir	70,245	38,021	35,932	22,247	13,165	9,184	5,235	2,784	3,876	2,425	7,294	210,408
Subalpine fir	5,760	2,862	2,790	1,867	497	664	92	-1	275	39	37	14,882
Engelmann spruce	2,763	2,662	2,186	1,764	986	1,210	1,280	981	866	642	1,256	16,596
Western hemlock	8,028	7,591	6,445	3,721	3,228	2,206	1,575	686	610	341	-103	34,328
Western redcedar	22,774	7,542	7,422	6,074	3,417	2,855	1,987	664	916	1,203	5,500	60,354
Total softwoods	279,364	179,110	150,125	106,194	69,906	53,954	33,226	13,066	16,278	7,346	24,611	933,180
Aspen	XXXXXXX	11,122	789	717	318	121	178	19	--	14	--	13,278
Cottonwood	XXXXXXX	3,014	1,824	-606	1,736	-107	904	996	341	216	1,291	9,609
Total hardwoods	XXXXXXX	14,136	2,613	111	2,054	14	1,082	1,015	341	230	1,291	22,887
All species	279,364	193,246	152,738	106,305	71,960	53,968	34,308	14,081	16,619	7,576	25,902	956,067

Table 89.--Annual mortality of growing stock and sawtimber on other public and privately owned timberland in Idaho by species, 1980

Species	Growing stock	Sawtimber	
		International ¼-inch rule	Scribner rule
	- Thousand cubic feet -	- Thousand board feet -	
Douglas-fir	7,507	29,670	25,125
Ponderosa pine	3,384	16,852	13,780
Western white pine	5,193	20,019	17,393
Lodgepole pine	2,631	9,705	8,207
Whitebark pine	5	29	24
Limber pine	14	77	64
Western larch	2,887	10,449	9,013
Grand fir	6,676	26,956	23,038
Subalpine fir	962	4,213	3,548
Engelmann spruce	238	1,378	1,192
Western hemlock	733	3,595	2,919
Western redcedar	817	3,114	2,545
Total softwoods	31,047	126,057	106,848
Aspen	1,642	101	89
Cottonwood	742	3,608	3,118
Total hardwoods	2,384	3,709	3,207
All species	33,431	129,766	110,055

Table 90.--Annual mortality of growing stock on other public and privately owned timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand cubic feet													
Douglas-fir	740	996	1,040	658	1,255	562	760	239	155	467	131	85	419	7,507
Ponderosa pine	165	80	213	642	438	1,060	289	--	--	365	--	--	132	3,384
Western white pine	731	1,076	53	629	913	189	288	372	--	162	181	424	175	5,193
Lodgepole pine	354	562	539	175	653	39	291	--	--	--	18	--	--	2,631
Whitebark pine	--	--	--	--	5	--	--	--	--	--	--	--	--	5
Limber pine	--	--	--	--	--	14	--	--	--	--	--	--	--	14
Western larch	487	405	602	86	53	478	61	31	14	615	--	55	--	2,887
Grand fir	399	861	995	1,223	698	859	951	306	35	323	--	--	26	6,676
Subalpine fir	4	36	329	379	40	58	37	19	29	12	19	--	--	962
Engelmann spruce	--	--	--	36	22	49	83	--	17	31	--	--	--	238
Western hemlock	--	6	342	214	--	25	--	--	--	--	--	29	117	733
Western redcedar	--	171	--	164	--	--	--	21	237	224	--	--	--	817
Total softwoods	2,880	4,193	4,113	4,206	4,077	3,333	2,760	988	487	2,199	349	593	869	31,047
Aspen	541	946	137	18	--	--	--	--	--	--	--	--	--	1,642
Cottonwood	--	--	--	--	--	551	--	191	--	--	--	--	--	742
Total hardwoods	541	946	137	18	--	551	--	191	--	--	--	--	--	2,384
All species	3,421	5,139	4,250	4,224	4,077	3,884	2,760	1,179	487	2,199	349	593	869	33,431

[1]Less than 500 cubic feet

Table 91.--Annual mortality of sawtimber (International ¼-inch rule) on other public and privately owned timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	3,714	3,323	6,649	3,057	4,244	1,371	896	2,704	772	523	2,417	29,670
Ponderosa pine	656	2,831	2,482	6,058	1,725	--	--	2,207	--	--	893	16,852
Western white pine	248	3,501	5,280	1,115	1,743	2,306	--	1,024	1,150	2,536	1,116	20,019
Lodgepole pine	3,019	1,014	3,755	216	1,596	--	--	--	105	--	--	9,705
Whitebark pine	--	--	29	--	--	--	--	--	--	--	--	29
Limber pine	--	--	--	77	--	--	--	--	--	--	--	77
Western larch	1,860	519	322	2,890	364	188	87	3,853	--	366	--	10,449
Grand fir	3,755	6,483	3,775	4,558	4,923	1,513	227	1,552	--	--	170	26,956
Subalpine fir	1,063	2,013	210	307	192	100	153	69	106	--	--	4,213
Engelmann spruce	--	198	118	288	477	--	88	209	--	--	--	1,378
Western hemlock	1,615	966	--	132	--	--	--	--	--	167	715	3,595
Western redcedar	--	828	--	--	--	118	1,117	1,051	--	--	--	3,114
Total softwoods	15,930	21,676	22,620	18,698	15,264	5,596	2,568	12,669	2,133	3,592	5,311	126,057
Aspen	XXXXXXX	101	--	--	--	--	--	--	--	--	--	101
Cottonwood	XXXXXXX	--	--	2,714	--	894	--	--	--	--	--	3,608
Total hardwoods	XXXXXXX	101	--	2,714	--	894	--	--	--	--	--	3,709
All species	15,930	21,777	22,620	21,412	15,264	6,490	2,568	12,669	2,133	3,592	5,311	129,766

Table 92.--Annual mortality of sawtimber (Scribner rule) on other public and privately owned timberland in Idaho by species and diameter class, 1980

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Douglas-fir	2,921	2,678	5,547	2,603	3,669	1,200	797	2,407	687	465	2,151	25,125
Ponderosa pine	415	2,083	2,060	5,052	1,469	--	--	1,906	--	--	795	13,780
Western white pine	197	2,867	4,576	972	1,546	2,051	--	911	1,023	2,257	993	17,393
Lodgepole pine	2,451	843	3,220	186	1,414	--	--	--	93	--	--	8,207
Whitebark pine	--	--	24	--	--	--	--	--	--	--	--	24
Limber pine	--	--	--	64	--	--	--	--	--	--	--	64
Western larch	1,620	385	256	2,450	313	164	76	3,423	--	326	--	9,013
Grand fir	3,128	5,350	3,206	3,969	4,324	1,326	202	1,381	--	--	152	23,038
Subalpine fir	916	1,648	174	264	167	87	135	62	95	--	--	3,548
Engelmann spruce	--	162	97	250	418	--	79	186	--	--	--	1,192
Western hemlock	1,278	741	--	115	--	--	--	--	--	149	636	2,919
Western redcedar	--	639	--	--	--	95	933	878	--	--	--	2,545
Total softwoods	12,926	17,396	19,160	15,925	13,320	4,923	2,222	11,154	1,898	3,197	4,727	106,848
Aspen	XXXXXXX	89	--	--	--	--	--	--	--	--	--	89
Cottonwood	XXXXXXX	--	--	2,338	--	780	--	--	--	--	--	3,118
Total hardwoods	XXXXXXX	89	--	2,338	--	780	--	--	--	--	--	3,207
All species	12,926	17,485	19,160	18,263	13,320	5,703	2,222	11,154	1,898	3,197	4,727	110,055

Table 93.--Annual mortality of growing stock on other public and privately owned timberland in Idaho by cause of death and species, 1980

Species	Cause of Death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand cubic feet								
Douglas-fir	865	2,215	64	--	2,661	57	--	1,645	7,507
Ponderosa pine	1,843	685	--	--	353	53	22	428	3,384
Western white pine	824	4,113	--	--	--	--	47	209	5,193
Lodgepole pine	802	906	--	--	28	581	--	314	2,631
White bark pine	--	--	--	--	--	--	--	5	5
Limber pine	--	14	--	--	--	--	--	--	14
Western larch	1,223	670	--	--	281	24	29	660	2,887
Grand fir	2,386	3,290	--	--	396	20	100	484	6,676
Subalpine fir	14	48	--	--	36	--	--	864	962
Engelmann spruce	--	22	--	--	132	--	16	68	238
Western hemlock	--	--	--	--	85	--	214	434	733
Western redcedar	--	164	--	--	482	--	171	--	817
Total softwoods	7,957	12,127	64	--	4,454	735	599	5,111	31,047
Aspen	--	1,230	--	--	--	14	18	380	1,642
Cottonwood	--	--	--	--	--	--	--	742	742
Total hardwoods	--	1,230	--	--	--	14	18	1,122	2,384
All species	7,957	13,357	64	--	4,454	749	617	6,233	33,431

Table 94.--Annual mortality of sawtimber (International ¼-inch rule) on other public and privately owned timberland in Idaho by cause of death and species, 1980

Species	Cause of Death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand board feet, International ¼-inch rule								
Douglas-fir	4,440	7,536	370	--	13,169	40	--	4,115	29,670
Ponderosa pine	9,448	3,885	--	--	1,716	--	103	1,700	16,852
Western white pine	3,951	14,896	--	--	--	--	--	1,172	20,019
Lodgepole pine	3,413	5,219	--	--	161	--	--	912	9,705
White bark pine	--	--	--	--	--	--	--	29	29
Limber pine	--	77	--	--	--	--	--	--	77
Western larch	5,231	1,069	--	--	366	--	--	3,783	10,449
Grand fir	9,764	14,028	--	--	1,023	--	--	2,141	26,956
Subalpine fir	77	261	--	--	190	--	--	3,685	4,213
Engelmann spruce	--	119	--	--	793	--	88	378	1,378
Western hemlock	--	--	--	--	364	--	966	2,265	3,595
Western redcedar	--	828	--	--	2,286	--	--	--	3,114
Total softwoods	36,324	47,918	370	--	20,068	40	1,157	20,180	126,057
Aspen	--	--	--	--	--	--	101	--	101
Cottonwood	--	--	--	--	--	--	--	3,608	3,608
Total hardwoods	--	--	--	--	--	--	101	3,608	3,709
All species	36,324	47,918	370	--	20,068	40	1,258	23,788	129,766

Table 95.--Annual mortality of sawtimber (Scribner rule) on other public and privately owned timberland in Idaho by cause of death and species, 1980

Species	Cause of Death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand board feet, Scribner rule								
Douglas-fir	3,769	6,385	330	--	11,322	24	--	3,295	25,125
Ponderosa pine	7,862	3,231	--	--	1,396	--	79	1,212	13,780
Western white pine	3,474	12,925	--	--	--	--	--	994	17,393
Lodgepole pine	2,965	4,363	--	--	130	--	--	749	8,207
White bark pine	--	--	--	--	--	--	--	24	24
Limber pine	--	64	--	--	--	--	--	--	64
Western larch	4,629	910	--	--	326	--	--	3,148	9,013
Grand fir	8,373	12,014	--	--	876	--	--	1,775	23,038
Subalpine fir	61	225	--	--	163	--	--	3,099	3,548
Engelmann spruce	--	97	--	--	692	--	78	325	1,192
Western hemlock	--	--	--	--	298	--	741	1,880	2,919
Western redcedar	--	639	--	--	1,906	--	--	--	2,545
Total softwoods	31,133	40,853	330	--	17,109	24	898	16,501	106,848
Aspen	--	--	--	--	--	--	89	--	89
Cottonwood	--	--	--	--	--	--	--	3,118	3,118
Total hardwoods	--	--	--	--	--	--	89	3,118	3,207
All species	31,133	40,853	330	--	17,109	24	987	19,619	110,055

Table 96.--Area of other public and privately owned woodland in Idaho by forest type and ownership class, 1981

Forest type	Ownership class			Total
	Other public	Forest industry	Nonindustrial private	
	WOODLAND Thousand acres			
Pinyon-juniper	42.1	--	38.6	80.7
Juniper	306.3	0.2	62.2	368.7
Western juniper	132.9	--	28.5	161.4
Total woodland softwoods	481.3	0.2	129.3	610.8
Oak	([1])	--	--	([1])
Mountain brush	22.8	0.4	19.1	42.3
Riparian	12.4	0.8	56.7	69.9
Other hardwoods	43.3	8.8	43.3	95.4
Total woodland hardwoods	78.5	10.0	119.1	207.6
All types	559.8	10.2	248.4	818.4

[1]Less than 50 acres.

Table 97.--Net volume, net annual growth and annual mortality of other public and privately owned woodland in Idaho by species and ownership class

Species	Ownership class			Total
	Other public	Forest industry	Nonindustrial private	
	WOODLAND			
	Thousand cubic feet			
Net volume, 1981:				
Douglas-fir	2,477	--	2,634	5,111
Western redcedar	55	--	348	403
Aspen	103	--	--	103
Cottonwood	85	--	530	615
Pinyon/juniper	226,205	29	71,038	297,272
Woodland hardwoods	31,640	522	23,952	56,114
Total	260,565	551	98,502	359,618
Net annual growth, 1980:				
Douglas-fir	64	--	82	146
Western redcedar	3	--	18	21
Aspen	4	--	--	4
Cottonwood	3	--	19	22
Pinyon/juniper	3,875	2	1,198	5,075
Woodland hardwoods	533	28	987	1,548
Total	4,482	30	2,304	6,816
Annual mortality, 1980:				
Douglas-fir	--	--	--	--
Western redcedar	--	--	--	--
Aspen	--	--	--	--
Cottonwood	--	--	--	--
Pinyon/juniper	99	--	--	99
Woodland hardwoods	13	1	26	40
Total	112	1	26	139

APPENDIX IV: TREE SPECIES NATIVE TO IDAHO

Coniferous

Grand fir	*Abies grandis*
Subalpine fir	*A. lasiocarpa*
Western juniper	*Juniperus occidentalis*
Utah juniper	*J. osteosperma*
Rocky Mountain juniper	*J. scopulorum*
Subalpine larch	*Larix lyallii*
Western larch	*L. occidentalis*
Engelmann spruce	*Picea engelmannii*
Blue spruce	*P. pungens*
Whitebark pine	*Pinus albicaulis*
Lodgepole pine	*P. contorta*
Limber pine	*P. flexilis*
Western white pine	*P. monticola*
Ponderosa pine	*P. ponderosa*
Douglas-fir	*Pseudotsuga menziesii* var. *glauca*
Western redcedar	*Thuja plicata*
Western hemlock	*Tsuga heterophylla*
Mountain hemlock	*T. mertensiana*

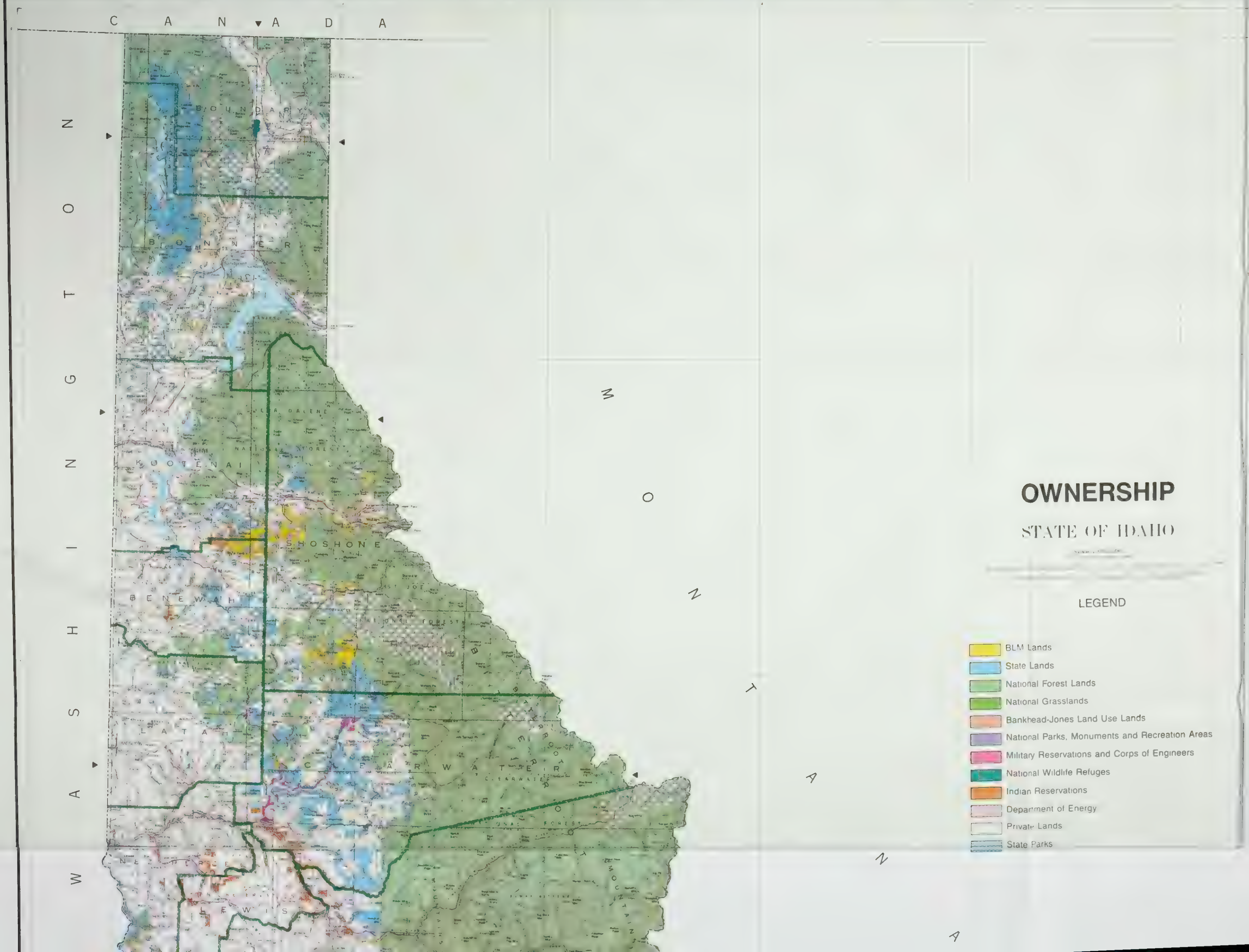
Deciduous

Boxelder	*Acer negundo*
Red alder	*Alnus rubra*
Paper birch	*Betula papyrifera*
Green ash	*Fraxinus pennsylvanica*
Balsam poplar	*Populus balsamifera*
Black cottonwood	*P. trichocarpa*
Quaking aspen	*P. tremuloides*
Cascara buckthorn	*Rhamnus purshiana*
Peachleaf willow	*Salix amygdaloides*

Benson, Robert E.; Green, Alan W.; Van Hooser, Dwane D. Idaho's forest resources. Resource Bulletin INT-39. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station; 1987. 114 p.

Presents highlights of the forest resources of Idaho as of 1981. Describes the forest resources, their extent, condition, and location, and discusses levels of some nontimber use of forest lands. Includes statistical tables: area by land classes, ownership, growing-stock and sawtimber volumes, growth, mortality, roundwood products output, utilization, and residues.

KEYWORDS: timberland, forest inventory, timber volume, timber mortality, timber removals



OWNERSHIP

STATE OF IDAHO

LEGEND

- BLM Lands
- State Lands
- National Forest Lands
- National Grasslands
- Bankhead-Jones Land Use Lands
- National Parks, Monuments and Recreation Areas
- Military Reservations and Corps of Engineers
- National Wildlife Refuges
- Indian Reservations
- Department of Energy
- Private Lands
- State Parks

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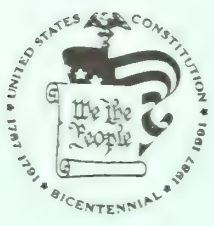

United States
Department of
Agriculture

Forest Service

**Intermountain
Research Station**

Resource Bulletin
INT-40

Montana's Timber Supply: An Inquiry Into Possible Futures

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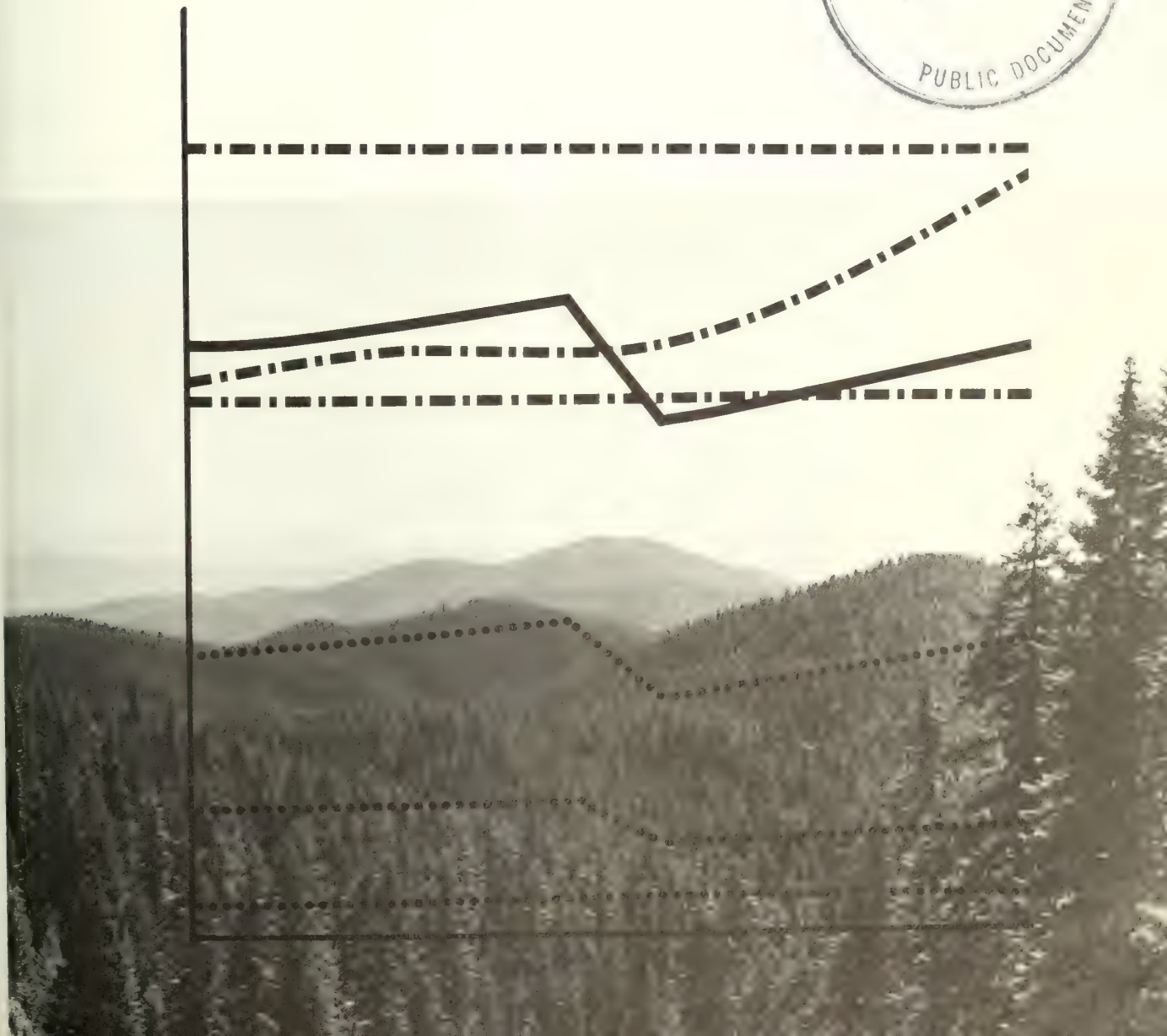

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March 1987
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RESEARCH SUMMARY

Will there be adequate timber inventory available to meet future demands for forest products? Will Montana's forest industry have to substantially reduce harvest on its land in the near future? What is the role of National Forests and other nonindustry landowners in providing timber, specifically regarding their ability to offset a possible reduction in industrial harvest? What will be the status of inventory and harvesting by the year 2030? This study was designed to answer these questions.

The basic analytical tool used in this study is the Montana Timber Market Model (MTMM), a computer simulation model consisting of timber inventory and economic components. Analyses were conducted statewide and by three substate regions (northwest, southwest, and central) for lands managed by the Forest Service, U.S. Department of Agriculture, the Montana Department of State Lands, forest industry, nonindustrial private, and all other public owners. Thirty-one timber-related scenarios, combinations of timber harvest and log processing levels, were evaluated to assess their impact on timber inventory and economic variables.

Results comparing expected timber harvest and log processing levels portray a reasonably optimistic future with respect to maintaining the recent past, except for the northwest and possibly the southwest substate regions. Of the hundred-plus combinations of timber-related scenarios and geographical areas, almost 20 percent indicate a consistent surplus of deliveries over processing levels through the year 2030, about a third show a consistent deficit, and about 45 percent indicate mixed results—surplus changing to deficit or vice versa. A substantial majority of the deficits identified applies to the northwest substate region. There, the inability of forest industry to maintain harvest levels is the major factor contributing to the deficit. The outlook for the central substate region is the most optimistic, with surpluses of log deliveries over processing levels occurring in about half of the scenarios. The southwest substate region also predominantly shows surpluses, at least until early in the next century when some deficits appear.

Four scenarios are featured for in-depth discussion—High Harvest, Low Harvest, Base Harvest, and Plausible Harvest. The Base Harvest and the Low Harvest scenarios are similar, with the future looking like a continuation of the recent past until about 2000 when large declines take place. Plausible Harvest scenarios portray a future modestly above the recent past, dropping just below that level around 2005, and then rising. The High Harvest scenarios portray a future of modest but constant expansion throughout the analysis period.

The Plausible Harvest scenario consists of the most realistic harvest-related assumptions currently available. This scenario shows a statewide surplus (deliveries exceeding processing needs) until about 2005, when a deficit with respect to supply-demand equilibrium begins and lasts through the end of the analysis period (2030).

The study results have several important timber inventory and economic implications. First, there is a general statewide increase in growing stock inventory, despite decreases on forest industry lands. Second, the projected distribution of harvest by diameter classes indicates a trend toward harvest of smaller trees. Third, except for the most ambitious timber harvest scenarios, there seems to be little opportunity for timber-based employment increases to promote economic development. Finally, stumpage prices are expected to increase under all scenarios.

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INTRODUCTION

Montana could face a variety of economic and social problems in the near future as a result of impending problems related to timber supply, in the view of some concerned people. The fundamental question is: Will there be an adequate timber inventory available to meet future demands for forest products? Not surprisingly, this question focuses attention on the State's two largest suppliers of timber—Montana's forest industry and the Forest Service, U.S. Department of Agriculture.

Uncertainties surrounding timber supplies from these ownerships give rise to several related concerns. For instance: Is the forest industry harvesting timber at an unsustainable rate on its own land, especially in the northwest part of Montana? How long will it take for timber inventory to be so depleted that a reduction in harvesting is required?

Some analyses (Green and others 1985) suggest the possibility of a bleak future. In recent years, industrial lands have contributed 30 to 40 percent of the total log supply while accounting for only about 17 percent of the inventory volume.

A related question is: If industrial lands contribute less to the State's timber harvest, can harvests from National Forests or other ownerships offset the decline? Is a decreased level of total timber harvest inevitable?

Some argue (IFRC 1985) that there is more than ample timber available on the National Forests. But the availability of timber from National Forests depends on decisions regarding the availability of nontimber products as well. National Forest planning analyzes alternative land uses, ranging from emphasis on producing market commodities to emphasis on amenities and other nontimber uses. These choices have substantially different timber harvest and inventory implications.

And more questions: Even if the statewide level of timber harvest can be sustained, will there be regional shortages within the State? Has the best timber already been logged? And is what remains substantially lower in quality and smaller in size?

A multiagency study team was formed early in 1985 to address such questions. Specifically, with respect to future timber inventories and economic implications, the team set out to compare various combinations of future timber harvest levels to potential log processing needs through the year 2030. In this publication, we discuss the methods used in this study and the results, indicate study uses and limitations, and then offer some conclusions.

THE ANALYTICAL APPROACH

The modeling effort in this study is based on four premises:

1. Timber supply decisions differ among ownerships. Some owner classes have a much greater propensity to hold timber in inventory than others (Jackson 1984). Thus, supply modeling should reflect the major classes of forest landowners important to Montana.
2. The level of timber harvesting must ultimately be limited by timber inventory or the amount of timber in existence. Hence, part of the modeling effort must be devoted to keeping track of changes in the quantity and quality of existing timber as affected by future harvest and growth levels.
3. The modeling effort should be designed to investigate a variety of timber-related scenarios, not simply a single, "most likely" situation. Therefore, a set of "what if" scenarios should be identified that span the range of timber harvest and log processing possibilities, from major increases to substantial decreases.
4. The scope of study should have a sufficiently detailed focus so as to provide information and results pertaining to specific geographic and landowner classes. More specificity is better than less, and the degree of specificity achieved should be limited only by data restrictions, modeling limitations, and the need to maintain confidentiality of information concerning individual landowners.

The philosophy in these premises is manifest in the way scenarios were formulated, how the simulation model was constructed, and how the study's scope was defined.

Study Scope

Ideally, this study would be conducted with a great deal of specificity regarding landowner classes and geographic areas within Montana—the more the better. Unfortunately, data limitations pertaining to geographical classes compelled the use of relatively broad classes. This then affected specification of landowner classes.

Figure 1 shows the three distinct substate regions we used in this study. These regions largely correspond to the mountainous portions of Montana: the northwest and southwest regions generally lie west of the Continental Divide, while the central region is to the east. The boundaries for these regions were based on timber inventory considerations, each corresponding to one or more "working circles" used in the most recent Montana forest

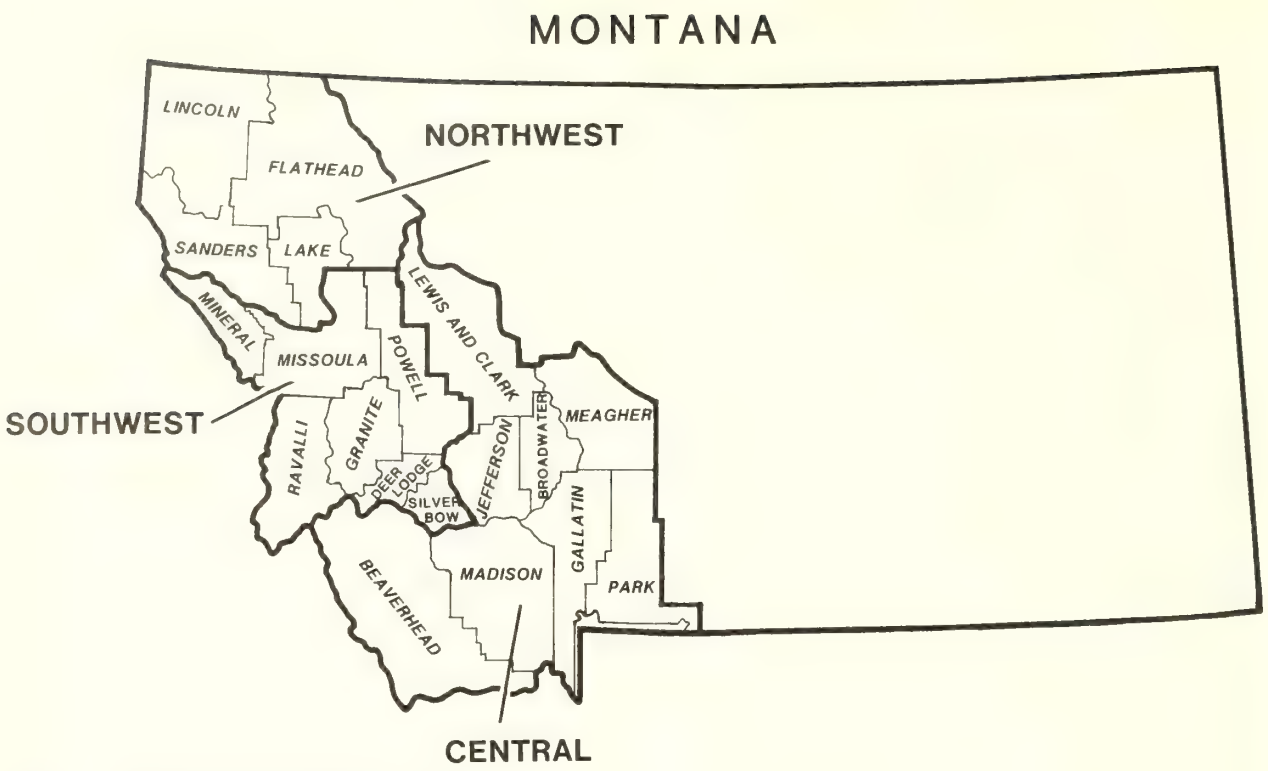

Figure 1—Multicounty analysis regions of Montana.

survey. They also correspond closely to timbershed boundaries, self-contained timber harvest and processing centers. Almost all of Montana's timber inventory and harvest activities are contained in the three designated substate regions, with the northwest accounting for the largest portion, followed closely by the southwest, and the central region a distant third.

Although there appear to be four regions, we structured our analyses around only the three. The "eastern" portion of Montana is not an analytical substate region; its harvest and inventory characteristics are reflected at the State level only. Because the eastern portion of Montana plays a relatively minor role in Montana's overall timber-based economy, little is lost by not distinguishing it as a substate region.

The following landowner classes were separately distinguished and used in this study:

Landowner classes	Land descriptions
Department of State Lands	All School Trust Lands, including the State Forest System
Forest industry	Lands owned by companies or individuals operating wood-using plants
Other or nonindustrial private	Privately owned forest land, not under forest industry ownership
USDA Forest Service	National Forests

These four landowner classes were analyzed with respect to the three substate regions shown in figure 1. These combinations account for the vast majority of the timber resource in Montana—89 percent of the growing stock inventory.

So that all forest land is included in this study, forest land not contained in a combination of specified landowner class and substate region class is included in an "other" category. This is important because of how lands in this category are treated in the Montana Timber Market Model (MTMM), discussed later. When study results are presented, harvest and delivery information for lands assigned to the "other" category for inventory manipulation are assigned back to their respective substate regions, making results presented for substate regions complete.

Scenarios

In this study a "scenario" refers to a specific combination of potential log processing levels and timber harvest levels. We postulate several log processing levels to represent potential needs of the timber-using mills in Montana's forest products industry. Harvest level possibilities reflect the ability and willingness of the forest owner classes to meet or satisfy those processing needs. In a sense, alternative levels of log processing correspond to demand aspects of the scenarios, while harvest levels correspond to the supply aspects.

In total, 31 harvest-related scenarios were evaluated. Table 1 shows that the 31 scenarios are based on three approaches to specifying log processing levels, four to specifying harvest levels for the Forest Service, and three to specifying non-Forest Service harvest.

Also, the study team developed a special scenario, Plausible Harvest, based on what was believed to represent realistic harvest-related and processing-related assumptions. This special scenario, along with three others

Table 1—Log processing and timber harvest level combinations comprising analytical scenarios used in study. Scenarios featured in depth in this publication are shown in bold typeface.

Log processing levels	Timber harvest levels: USDA Forest Service	Timber harvest levels: Other ownerships[1]	Featured scenario
Supply and demand	**Market alternatives**	**Inventory share (IS)**	**High Harvest**
		Cut = growth (C = G)	
		Recent past (RP)	
	Preferred alternatives	IS	
		C = G	
		RP	
		Special[2]	**Plausible Harvest**
	Nonmarket alternatives	IS	
		C = G	
		RP	**Low Harvest**
	Recent past	RP	
Recent past	Market alternatives	IS	
		C = G	
		RP	
	Preferred alternatives	IS	
		C = G	
		RP	
	Nonmarket alternatives	IS	
		C = G	
		RP	
	Recent past	**RP**	**Base Harvest**
Mill capacity	Market alternatives	IS	
		C = G	
		RP	
	Preferred alternatives	IS	
		C = G	
		RP	
	Nonmarket alternatives	IS	
		C = G	
		RP	
	Recent past	RP	

[1]BLM and BIA harvests always set at their recent past.
[2]"Special" consists of Montana Division of Forestry harvest set at 50 million bd ft, [redacted] private landowner harvest at the long-term average, and all other non-Forest Service owners set at their recent past.

(named in table 1), are the "featured" scenarios in this paper. The four featured scenarios best address the key timber supply issues. In addition to Plausible Harvest, two of them represent expected extremes in future harvest levels on the National Forests and for all other owners: High Harvest and Low Harvest. The fourth is intended to portray the current frame of reference many people have, an extension of recent harvest levels into the future: Base Harvest.

Log Processing Levels—Quite clearly, the annual amount of timber ultimately processed by the mills in Montana will be determined by the economic forces of supply and demand as they operate through the markets for forest products—plywood, lumber, pulp, and paper. This study attempts to simulate that situation up to the year 2030 through use of an econometric supply-demand model for Montana timber as one approach to specifying desired processing levels.

Unfortunately, econometric supply-demand models cannot reflect all necessary economic phenomena and do not perfectly predict future levels of supply and demand. We therefore supplemented the supply-demand approach to specifying processing levels by adding two frequently discussed perspectives—the recent past processing level and the mill capacity level.

The recent past level corresponds to a short-term average, the arithmetic mean level of annual timber processed over the 5 years 1980 through 1984. This was determined by converting timber harvest data into levels of timber processed in each substate region by accounting for log movements from timber-cut origin to log-processing destination. All timber harvest (Niccolucci 1986) and 1980 interregional log movement data (Keegan 1986) were obtained from unpublished records.

Mill capacity refers to the theoretical maximum annual amount of logs that mills could use at full production. Specific criteria for full capacity vary with the type of mill (e.g., sawmill, plywood) but generally are based on two to three 8-hour shifts per day and 230 to 260 operating days per year. Actual mill capacity used is typically 70 to 90 percent of the full capacity level; this is consistent with

capacity utilization rates in United States manufacturing industries for the past 40 years (CEA 1986). Estimates of regional and statewide mill capacity were obtained from the Bureau of Business and Economics Research, University of Montana (Keegan 1986).

Timber Harvest Levels—Seven approaches were used to establish the levels of timber harvest for all but the Plausible Harvest scenario, as can be seen in table 1. Four pertain to the Forest Service and three to non-Forest Service owners.

The quantity of timber planned for harvest on Montana's National Forests is determined according to the provisions of the 1976 National Forest Management Act (NFMA) together with implementing regulations. The NFMA requires that a plan be selected from among Forest planning alternatives that vary in degree of timber emphasis and harvest. Each alternative for each Forest is associated with a different land base for managing timber (the "suitable" base) and a different schedule of timber harvests over time.

In this study, then, three of the four approaches to specifying Forest Service harvest were tied to existing Forest Service planning alternatives. Two of the alternatives encompass the range of timber harvest levels possible from the Forest Service. The "market" alternatives (emphasizing timber and other market-oriented production) establish the upper bound, and the "nonmarket" alternatives (emphasizing nonmarket or amenity-oriented outputs) represent the lower bound. The third one is termed "preferred," that planning alternative identified by National Forest officials as representing their choice as to the best plan for managing the Forest.

For any given scenario, all National Forests within the State were assumed to follow the same type of approach (table 2), such as all "preferred" alternatives. No mixing of alternatives was permitted within a scenario. Data were obtained from the harvest schedules contained in draft Forest planning documents.

In addition to harvests specified by planning alternatives, another Forest Service harvest level was specified, this one at the recent past or short-term average represented by the mean of the annual harvests from 1980 through 1984 (see table 1).

Table 2—Forest planning alternatives used to represent USDA Forest Service timber harvest approaches

National Forest	Draft date	Forest Plan alternative		
		Nonmarket	Preferred	Market
Beaverhead	1985	D[1]	H	B
Bitterroot	1985	J	E	A
Custer	1985	8	6	7
Deerlodge	1985	J	M	C
Flathead	1984	16	11	2
Gallatin	1985	3	7	2
Helena	1985	G	E	C
Lewis & Clark	1984	C	G	A-1
Lolo	1985	J	D	C
Kootenai	1985	F	J	L

[1]Readers interested in definitive descriptions of the alternatives will need to consult the appropriate draft Environmental Impact Statements for each Forest.

For non-Forest Service ownership classes, timber harvests were specified in three ways:

- **Recent past**. Annual harvest was set at the short-term average or arithmetic mean of annual harvest levels over the 5-year study period, 1980 through 1984, inventory permitting.
- **Cut = growth**. Based on timber inventory data, annual harvest was set at a level equal to net annual growth.
- **Inventory share**. Based on timber inventory data:
  Annual harvests = (timber processing volume – [Forest Service + "other" harvests]) × percentage of total non-Forest Service sawtimber volume (board foot measure) accounted for by the ownership class.

As with Forest Service harvest alternatives, no mixing of approaches among ownership classes was permitted within a scenario.

Of the 31 scenarios, only the Plausible Harvest scenario used harvest specifications different from the seven described above. In that scenario, the annual Forest Service harvests consisted of those in preferred alternatives; an annual harvest of 50 million bd ft was assumed from lands administered by the Montana Department of State Lands, the target level of harvest established for these lands (MDF 1986); [redacted] private landowner harvest was set at the long-term average, the arithmetic mean of annual harvest levels over the 15 years 1970 through 1984; and harvests from all other owners were set at the recent average.

For all 31 scenarios, annual harvest for the "other" ownership category was set equal to the recent average over the 1980 to 1984 period. Recall, this category corresponds to all ownerships in the eastern portion of Montana and any ownership in a substate region that was not specifically identified earlier.

Simulation Model

The main analytical tool used to assess resource and market implications of the various timber-related scenarios is a computer simulation model known as the Montana Timber Market Model (MTMM) (USDA FS 1984). MTMM is capable of estimating the current and future equilibrium supply-demand prices and quantities for timber, timber stumpage prices, and related employment and income, and it provides information regarding the status of the timber inventory. While MTMM is designed to operate in the economic environment of supply and demand, it can also simulate production associated with other specifications of future timber harvest and log processing levels. The primary use of MTMM is not as a tool for predicting the future, but instead as an analysis tool simulating the future.

The MTMM consists of a biological and an economic component. The biological component contains biological information used to model timber inventory. The economic component contains economic information used in economic projections of market structure and features of the wood products industry. The economic component of MTMM provides information on how much timber will be

harvested, where, and by which ownership class, based on the harvest-related scenarios specified. The biological component accepts that harvest information, adjusts the timber inventory to reflect changes resulting from the specified harvest, grows the residual stand, and waits for the next set of harvest-related instructions from the model's economic component. This process continues each year to the year 2030. In each simulation, MTMM keeps track of these biological and economic activities and provides descriptions of their variables at various points in time.

The major type of biological information used by MTMM is the forest inventory data for Montana—volumes by diameter and growth and mortality rates. Both published information (Green and others 1985) and unpublished data (Laux 1986; Long 1986) have been used. Within MTMM, the statewide timber inventory is divided into dynamic and static parts. The dynamic part pertains to the Forest Service, forest industry, Montana Department of State Lands, and nonindustrial private landowners in each of the three specified substate regions, northwest, southwest, and central. The static portion pertains to the "other" landowner class discussed earlier and includes the USDI Bureau of Indian Affairs, the USDI Bureau of Land Management, and miscellaneous public owners in those substate regions, together with all ownerships in the eastern part of Montana. This static portion of the inventory database is not updated annually with cut and growth estimates because available inventory data for those ownerships and areas are either unavailable or unreliable. Because lands in this category constitute a small fraction of Montana's timber resource (about 11 percent), possible variations in harvests from those lands would have little effect on the situations being simulated, largely immaterial to the results of the study.

The major types of economic information correspond to those required for supply-demand modeling, harvest specification and log movement, and employment impact estimation. The supply and demand equations are based on the work of Majerus (1982), Jackson (1983), and extended by Connaughton and others (in preparation). Equations are based on data from 1962 to 1980 and are applicable at the State level only. Because the equations are sensitive to both Forest Service harvest and non-Forest Service growing stock volumes, there will be a different equilibrium solution for each specification of the land area devoted to growing timber. Estimates of future timber prices are from preliminary estimates provided by Haynes (1986) for the 1985 Resources Planning Act Assessment (USDA 1981) update; those preliminary estimates were produced by the Timber Assessment Market Model (Adams and Haynes 1980) and were based on regionally specific product price and production cost projections. All prices and price computations in the MTMM are expressed in real (or constant) 1985 dollars, based on the GNP Implicit Price Deflator (CEA 1985). All economic impact multipliers used to estimate employment and income effects come from IMPLAN (Sieverts and others 1983), the Forest Service's secondary data, input-output modeling system. The multipliers produced are backward-linked, Type II. Changes in technology and gains in production efficiency will change these multipliers over time, but because these changes could not be projected, multipliers could not be updated. In effect, this study assumes constant technology, an assumption inherent to input-output methodology.

The MTMM requires a number of assumptions and known information. The most important are:

1. The volume of timber reported harvested from an owner/area inventory has been increased by 12 percent of the board foot harvest volume to account for that portion of inventory cut but not delivered to the mills—unused material and loss due to logging (adapted from Howard and Fiedler 1984).

2. Overrun is the amount by which recovered lumber, or its equivalent, exceeds the scaled (measured) volume of the logs from which the product was made. Overrun is usually expressed as a percentage of scaled volume and is greater for smaller sized trees and for more efficient manufacturing technologies. Overrun estimates are based on expert opinion (Carr 1986; Moore 1986) and are updated by means of a linear trend from 150 percent in 1984, to 170 percent in 1994, to 180 percent in 2004, and constant thereafter.

3. Real lumber and wood product prices are assumed to increase at a compound annual rate of 0.71 percent, while manufacturing, logging, and hauling costs are assumed to increase at a 0.59 percent annual rate (adapted from Haynes 1986).

4. The timber inventory for non-Forest Service lands is reduced by the following percentages to reflect areas that have been set aside and areas considered inoperable (Long 1986):

Owner class	Substate region			
	Northwest	Southwest	Central	Eastern portion
	Percent			
Department of State Lands	4	8	8	0
Forest industry	4	8	7	0
Nonindustrial private	12	11	8	0

5. Timber harvest schedules from individual National Forests are allocated to counties and then to substate regions on the basis of the percentage distribution of Forest acreage (net) in counties within regions.

6. Montana timber harvests are distributed from the substate region of cut origin to the substate region of processing destination according to the following percentages of origin-region harvest (1980):

Origin substate region	Destination substate region				
	Northwest	Southwest	Central	Eastern portion	Other
	Percent				
Northwest	78	16	1	0	5
Southwest	2	94	4	0	0
Central	0	14	85	0	1
Eastern portion	0	0	12	84	4

7. Montana timber imports are added to substate regional timber deliveries according to the following ratios of regional imports to regional deliveries from within Montana (1980):

Destination substate region	Imports:internal
	Percent
Northwest	0.02
Southwest	12.75
Central	8.86
Eastern portion	0

8. All board foot (bd ft) measurements of timber volume are expressed in Scribner rule.

Once the MTMM was fully specified by providing the needed biological and economic information, the model was executed—one scenario at a time. Each execution resulted in detailed descriptions of the inventory and economic implications for the various harvest scenarios. Results could be directly interpreted at the substate region level, except for the scenarios based on supply-demand solutions. Those equations are applicable only at the overall State level because comparable equations do not exist for substate regions. To assess substate implications, statewide results were disaggregated to substate regions in proportion to regional market share, based on timber processed from 1980 through 1984.

RESULTS

The objectives of this study were to compare various combinations of timber harvest levels and log processing levels (scenarios) for Montana through the year 2030 and to evaluate those combinations in terms of timber inventory and economic implications. Log processing levels reflect the demand for timber, while timber harvest levels reflect timber supply. Of the 31 scenarios analyzed, four are particularly important and will be specifically featured in later discussions.

All timber harvest levels were compared against a set of log processing levels. These processing levels represent different portrayals of mill needs. Figure 2 shows five levels for Montana. The higher of the two horizontal levels represents the annual volume of logs needed to operate Montana's mills at "full mill capacity," 1,470 million bd ft annually; this approach was used in all scenarios based on "mill capacity." The lower level, slightly over 1,000 million bd ft annually, represents the amount required to allow the mills to continue operating as in the recent past; this approach was used in all scenarios based on the "recent past." Log processing levels based on either mill capacity or the recent past average can be disaggregated to substate regions, allowing comparisons between substate processing and harvest levels.

The three upward-sloping lines in figure 2 display log processing levels resulting from the supply-demand model used to make economic forecasts. The model is sensitive to Forest Service timber harvest and non-Forest Service timber inventory. Because the size of the "suitable" timber growing base on National Forests varies with Forest planning alternative, so do the associated Forest Service timber harvest and the supply-demand model results. The High Harvest schedule reflects National Forest planning alternatives emphasizing market (largely timber) production, the Low Harvest schedule reflects alternatives emphasizing nonmarket (largely nontimber) production, and the Plausible Harvest schedule is based on the set of preferred Forest planning alternatives. The Plausible Harvest scenario represents midlevel timber harvest and log processing assumptions. Log processing schedules resulting from the supply-demand model start at about the current level of log processing and gradually rise to about 1,500 million bd ft by 2030, which exceeds the present full mill capacity. Statewide supply-demand forecasts cannot be analytically disaggregated to substate regions. To facilitate comparisons with substate harvest levels, statewide levels were assigned to regions in proportion to historical market share.

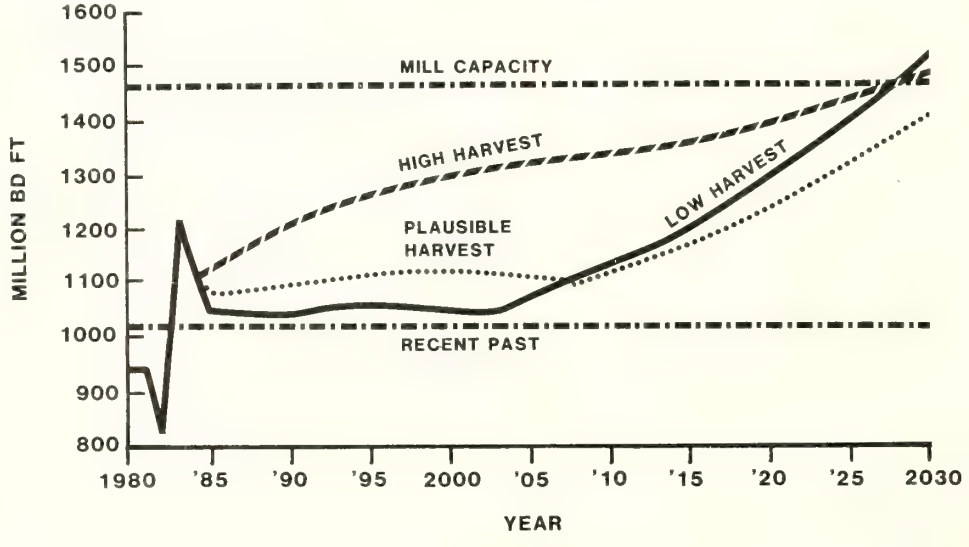

Figure 2—Montana annual log processing levels.

Comparisons of Timber Harvest and Log Processing Levels

Will the various specifications of timber harvest levels be adequate to meet the levels specified for log processing? Table 3 provides a summary for all scenarios analyzed and geographical regions evaluated in this study. Clearly, the answer depends largely on the specific combination being inspected. Of the 124 results shown, 22 (18 percent) indicate a surplus (+) of timber harvest over log processing levels throughout the duration of the analysis period, 1985 to 2030; in 40 cases (32 percent) there is a constant deficit (−); in 6 (5 percent) an equality (=); and mixed results occur in 56 cases (45 percent). A condition of equality (=) was one in which the total level of log processing was exactly met by the total level of timber harvest converted into deliveries by adjusting for interregional log movement. A surplus indicates an excess of total deliveries over the log processing level; a deficit means a shortage.

Noteworthy are the various scenarios where the "inventory share" (IS) is used to determine non-Forest Service harvest levels. First, these scenarios represent all of the equality (=) results, where the level of timber harvest is equal to the processing level specified. This is not surprising because the IS approach attempts to allocate needed timber harvest in proportion to inventory by ownership. If the inventory exists, the total allocation of harvest to owners will always exactly equal the needed harvest. Note that all equality results appear at the State level only.

Second, the IS approach provides the best depiction of the physical ability of the timber inventory to satisfy processing needs. Inspection of the Montana column shows there is enough timber to satisfy processing needs specified by the supply-demand and recent past average approaches, regardless of the Forest Service planning alternative specified. But the full mill capacity level cannot be met over the entire projection period because there simply is not enough timber inventory. A deficit develops by the year 2005 (+ −2005) when the Forest Service cut corresponds to the set of nonmarket alternatives. That is: If Forest Service timber harvests are deducted from full mill capacity processing levels, and if the remaining owner classes harvest timber in proportion to the percentage

Table 3—Summary results: timber harvest levels meeting log processing levels, by geographical area, based on log deliveries. Scenarios featured in depth in this publication are shown in bold typeface.

Log processing levels	Timber harvest levels: USDA FS	Timber harvest levels: Others	Geographical designation: Northwest	Southwest	Central	Montana	Featured scenarios
Supply and Demand	**Market alternatives**	**Inventory share (IS)**	**−**	**+ = 2000 − 2020**	**+**	**=**	**High Harvest**
		Cut = growth (C = G)	−	= − 2025	+	= + 2010 = 2020	
		Recent past (RP)	+ − 2000	+ − 2000	+ − 2020	+ − 2000	
	Preferred alternatives	IS	− = 2020	+ = 2000 − 2020	+	=	
		C = G	−	−	+	−	
		RP	+ − 2000	+ − 2000	−	+ − 2000	
		Special	**+ − 2005**	**+ − 2005**	**+ − 2020**	**+ − 2005**	**Plausible Harvest**
	Nonmarket alternatives	IS	− = 2025	+ = 2010	+	=	
		C = G	−	−	+ − 2000	−	
		RP	**= − 1990**	**+ = 1990 − 2000**	**−**	**= − 1990**	**Low Harvest**
	Recent past	RP	−	−	−	−	
Recent past	Market alternatives	IS	− = 2025	+ = 1990 − 2015	+	=	
		C = G	+	+	+	+	
		RP	+ − 2000 + 2010	+	+	+	
	Preferred alternatives	IS	− = 2020 + 2025	+ = 2000 − 2015	+	=	
		C = G	− + 1995	+	+	+	
		RP	+ − 2000 + 2025	+ − 2005	+	+ − 2000 + 2025	
	Nonmarket alternatives	IS	− = 2025	+ = 2010	+	=	
		C = G	− + 2005	− = 2000 + 2005	+	− + 2000	
		RP	+ − 2000	+ − 2000	−	+ − 2000	
	Recent past	**RP**	**= − 2000**	**= − 2000**	**= − 2000**	**= − 2000**	**Base Harvest**
Mill capacity	Market alternatives	IS	−	+ − 2015 + 2025	+ − 2015	+ − 2015	
		C = G	−	+	+	−	
		RP	−	+ − 2000 + 2015	− + 1995	−	
	Preferred alternatives	IS	−	+ − 2005	+ − 2005	+ − 2005	
		C = G	−	− + 1995	−	−	
		RP	−	+ − 2000	−	−	
	Nonmarket alternatives	IS	−	+ − 2005	+ − 2005	+ − 2005	
		C = G	−	−	−	−	
		RP	−	−	−	−	
	Recent past	RP	−	−	−	−	

Key: = means log deliveries equal processing level throughout analysis period, 1985 to 2030
+ means log deliveries exceed processing level
− means log deliveries below processing level.

Mixed symbols: first is condition beginning in 1985, which changes to a second condition (and perhaps later to a third) on the stated date and continues to 2030.

Note: Tolerance: total log deliveries within 1 percent of specified log processing levels.

each has of the non-Forest Service timber inventory, then harvest levels will exceed processing levels until 2005. In that year harvest level drops below the full mill capacity processing level because needed level of harvesting cannot be physically met. The deficit also develops by 2005 under the preferred alternatives. It is postponed until 2015 under the market alternatives.

Some substate regional results are also noteworthy, especially those for the northwest region. Recall from earlier discussion that concern over future timber supplies in that substate region was one factor that originally led to conducting this study. Results do, in fact, indicate a potential timber supply problem for the northwest substate region. That region accounts for 15 (38 percent) of all deficit (–) outcomes found in the study; these represent about half of the results for the northwest section. And except for one surplus (+), the remaining results are mixed. Figures in the northwest column in table 3 suggest an uncertain future, one that depends almost entirely on the scenario considered—the near-term future could be that of surplus, deficit, or equality.

The outlook for the southwest and central substate regions is not nearly as uncertain as the northwest. If negative results characterize the northwest, then surpluses characterize the central substate region, where 14 of the 31 results (45 percent) indicate surpluses and only seven deficits were found. Results from the southwest are a mixture of surpluses, deficits, and changes. Figures in the southwest and central columns in table 3 reveal that, overall, near-term surpluses prevail. Changes then begin to occur in the southwest around 2000 and slightly later in the central region.

However, because study procedures did not allow for changes in interregional log movements, substate region results should be inspected carefully. If statewide results indicate either surplus (+) or equality (=), there is enough overall timber to offset any deficits (–) at the substate level. Consider the first row of results (labeled High Harvest) shown in table 3: The northwest substate region shows a deficit (–); the central region shows a surplus (+); the southwest shows mixed results, beginning with a surplus; and the State shows equality (=). This means that the timber deliveries to the mills in the northwest (assuming no change in the existing pattern of log movements) are not enough to meet the specified processing level (established by apportioning the statewide solution to regions based on historical market share). Ample timber exists, but not in the correct place. If the pattern of log movement would change such that less timber is moved from the northwest to other substate regions or more timber is moved to the northwest from substate regions with surpluses, the northwest's deficit could be erased. Therefore, results for one subregion should be interpreted in light of both overall statewide results and those for other subregions. Changes in the location of processing capacity or log movement can be expected to mitigate regional surpluses and shortages over time.

The State—The four panels of figure 3 provide a more detailed look at the four featured scenarios for the entire State. Because several log processing levels are plotted on each panel, multiple scenarios are depicted, including some combinations that do not appear in table 3. That is, the mill capacity processing level is not part of any scenario shown, and the recent past processing level is not part of the Plausible, High, or Low Harvest scenarios.

This display convention will be used consistently in figures 3 through 6 and is intended to provide additional comparisons only. The pattern of information on each panel will remain constant: the lower lines (substate regions or owners) display timber harvest levels, upper lines (mill capacity, recent past, and supply-demand) display target log processing levels, and a middle line (total log deliveries) displays deliveries resulting from harvest levels adjusted for log movement. The reader should recall that timber harvest levels are always determined by the levels shown in table 1.

Figure 3 is a depiction of Montana's future that, more or less, also holds true for each of the substate regions. The curves for total delivery and the recent past level of log processing for the Base and Low Harvest scenarios are similar, both portraying a future comparable to the recent past until the next century at which time declines set in. The Plausible Harvest scenario provides for modest expansion over that of the recent past until the next century when deliveries more closely resemble the recent past. Finally, the High Harvest scenario provides for modest, but constant, expansion throughout the analysis period.

The Base Harvest scenario shown in the upper-left panel of figure 3 probably represents the mental picture many people have of Montana's future, that it will be an extension of the recent past. The harvest levels shown for the State and substate regions assume that all ownership classes will continue producing at the 1980 through 1984 annual average, inventory permitting. However, overall statewide drop in total deliveries around the year 2000 indicates that the timber inventory in some substate regions will be inadequate to maintain that harvest level. The sharp statewide drop in deliveries mirrors the harvest drop in the northwest substate region and to a lesser extent that of the southwest region. No harvest drop is anticipated for the central region.

As will be shown later, these harvest declines at the State and substate levels follow equal or larger declines in harvest from industry lands. Harvests from National Forest lands are constant, so there is no ability to offset the decline by industry. And after several years of declining harvest, inventories begin to build allowing harvest levels to increase. Timber harvest will support log processing levels as in the recent past until 2000, but will never reach the level that provides deliveries equal to full mill capacity.

The High and Low Harvest panels of figure 3 depict possible outcomes that, not surprisingly, range from few supply problems to many.

The High Harvest panel establishes the supply-demand model level of log processing, assuming the National Forests are managed under the set of market alternatives. Other ownerships harvest in proportion to inventory holdings. National Forest harvests are set at the planned levels, and the difference between the required processing level and National Forest harvest is made up from other ownerships on the basis of inventory share. Harvest levels under the High Harvest scenario would provide delivered logs exactly equal to the processing levels specified by the

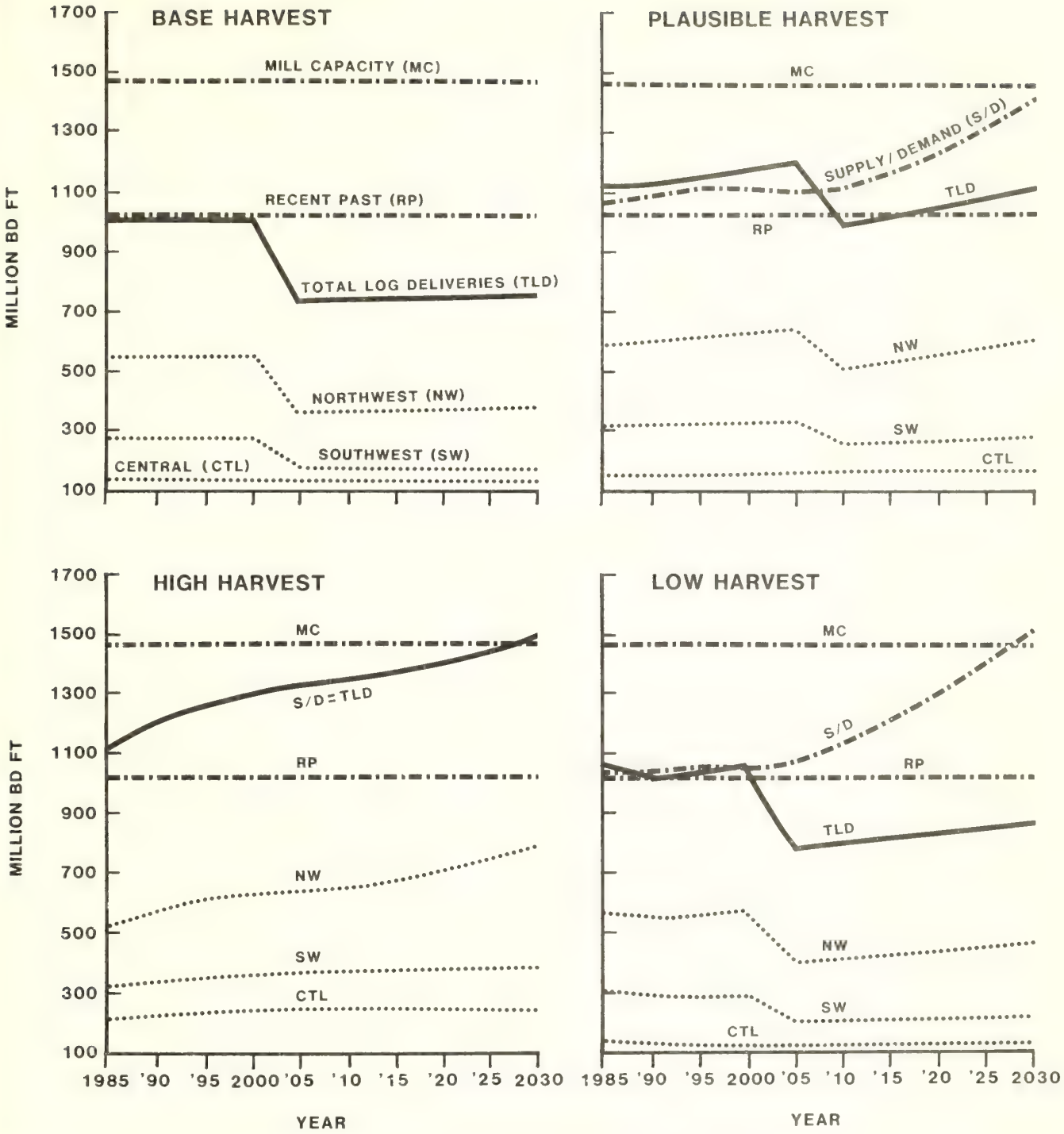

Figure 3—Annual timber harvest, log processing, and log delivery levels, by scenario and region.

supply-demand model. That level exceeds that needed to maintain processing as in the recent past, and it actually approaches that required by full mill capacity by the end of the analysis period. As shown later, this high level of harvest is almost entirely the result of increased harvesting on National Forests. Harvests in all substate regions increase. This is in sharp contrast with other scenarios that consistently show harvest decreases in the northwest and southwest substate regions.

The Low Harvest panel shows the most restrictive approach to timber harvest. Non-National Forest harvests are set at the average of the recent past, and National Forest harvests correspond to those in the nonmarket alternatives. The same (inventory-induced) harvest decrease shown in the Base Harvest scenario is present. The overall level of log deliveries initially equals but eventually drops below the log processing level specified by the supply-demand model, and the level is always far short of

the full mill capacity level. But this harvest level provides log deliveries roughly comparable to that required to maintain mills at the processing level of the recent past and that specified by the supply-demand model, at least until about 2005.

The Plausible Harvest panel sets National Forest timber harvest at the levels indicated by the preferred alternatives, the Montana Department of State Lands at 50 million bd ft annually, [redacted] private owners at their long-term average, and other ownership classes in accordance with their recent past (inventory permitting). Log processing levels are set by the supply-demand model. Because inventory again ultimately restricts harvest, overall harvest begins dropping around 2005 and increases after 2010 as inventories build. Nevertheless, until early in the next century, total harvest is always more than adequate to provide log deliveries that exceed the recent past log processing levels and that specified by the supply-demand model. Deliveries are always below the full mill capacity level. Because of the relatively higher level of harvest from National Forests, the overall harvest decline is postponed a few years compared to either the Base Harvest or the Low Harvest scenario.

Substate Regions—The four panels of figure 4 depict the scenarios for the northwest section of the State. On the Base Harvest scenario, the lower portion of the panel shows the regional level of timber harvest for the various ownerships, provided that each ownership continues to harvest as in the recent past, inventory permitting. In this scenario, forest industry's cut falls sharply around 2000 while other ownerships maintain a constant harvest. Industry's harvest decrease is a significant event portrayed by the panels for the northwest substate region. This results from inadequate inventory and is the major cause of the statewide harvest decline shown earlier in figure 3.

In actuality, the decrease in harvest is expected to be more gradual and to extend over a somewhat longer period than depicted in figure 4. The extremely sharp declines shown here and elsewhere are partially the result of the computer simulation model used and should not be literally interpreted to predict the timing of the drop. The Montana Timber Market Model depicts harvest at a steady rate until inventory is exhausted and then harvest plummets. This is because the MTMM deals with all lands within an ownership class, including forest industry lands, as if it were a single, composite entity. In fact, the forest industry sector is composed of a number of private owners, each with somewhat different inventory characteristics, making essentially independent timber harvesting decisions. Not all owners will exhaust their inventory or reduce harvest at the same time.

The upper portion of the Base Harvest scenario shows both processing levels established by the recent past average (436 million bd ft) and full mill capacity (762 million bd ft), together with the total level of log deliveries to the northwest substate region. Log deliveries to the northwest are not the same as total timber harvest in the northwest because a substantial volume of northwest harvest (about 16 percent) is delivered to southwest mills for processing. Regionally, the northwest is a net exporter. The amount of logs reaching northwest mills is always far less than full mill capacity, but is initially equal to that of the recent past before dropping considerably below by 2005.

For High and Low Harvest scenario panels in figure 4, the overall level of deliveries increases sharply for the High Harvest but remains about constant or decreases in the Low. Because the level of Forest Service harvest is so high in the High Harvest scenario, the additional level of cut needed from other ownerships to meet the processing level specified by the supply-demand model is substantially reduced. Therefore, the drop in industry harvest shown elsewhere is absent, and industry harvest actually increases. But industry harvest begins at only about 90 million bd ft in this scenario, which is substantially below that shown (about 200 million bd ft) in other scenarios and the recent past level of harvest. By 2030 the harvest barely reaches that of the starting point in other scenarios. In effect, the drop in industry harvest occurs immediately rather than later. While the overall level of log deliveries to the northwest never equals that specified by full mill capacity, it continually increases, generally lies above the level of the recent past, and approximates that specified in the supply-demand schedule by the end of the analysis period.

The Plausible Harvest panel depicts a future between that of the High Harvest scenario and that of either the Low or Base Harvest. Because Forest Service timber harvest increases constantly, the drop in industry harvest shown is smaller and later than in either that of the Low or Base Harvest approaches. Under this scenario, log deliveries to the northwest exceed the level of the recent past, except for about one decade early in the next century, and exceed the level specified by the supply-demand model during the first part of the analysis period (until 2005), but are always below full mill capacity.

The four panels of figure 5 contain comparable information for the southwest section. The format of each panel is the same as in figure 4—bottom lines display harvest levels and top lines display either total log deliveries or log processing levels. The recent past annual average of log processing in the southwest region was about 415 million bd ft, while mill capacity equals 446 million bd ft annually. And again: overall delivery decreases, resulting from drops in industry harvest, are only partially made up by smaller harvest increases from National Forests.

Several aspects of figure 5 are noteworthy. First, while the patterns of timber harvest for the southwest are similar to those of the northwest, they are at a consistently lower level. Second, nonindustrial private owners show the potential to substantially increase their harvest, with cut under the High Harvest scenario nearly double that of the Base Harvest. Third, log deliveries to the southwest substantially exceed harvest, mainly because of log movement from the northwest. About a fourth of the southwest's log deliveries come from northwest region harvests. The southwest region is a net importer of logs. Fourth, a relatively bright near-future is portrayed.

Under all but the Base Harvest scenario, log deliveries to the southwest approximate or exceed all processing level specifications for the remainder of this century. At about the year 2000, deliveries start to fall short of recent past processing levels in the Base Harvest. This occurs at about 2005 for the Low Harvest. At about 2010, deliveries

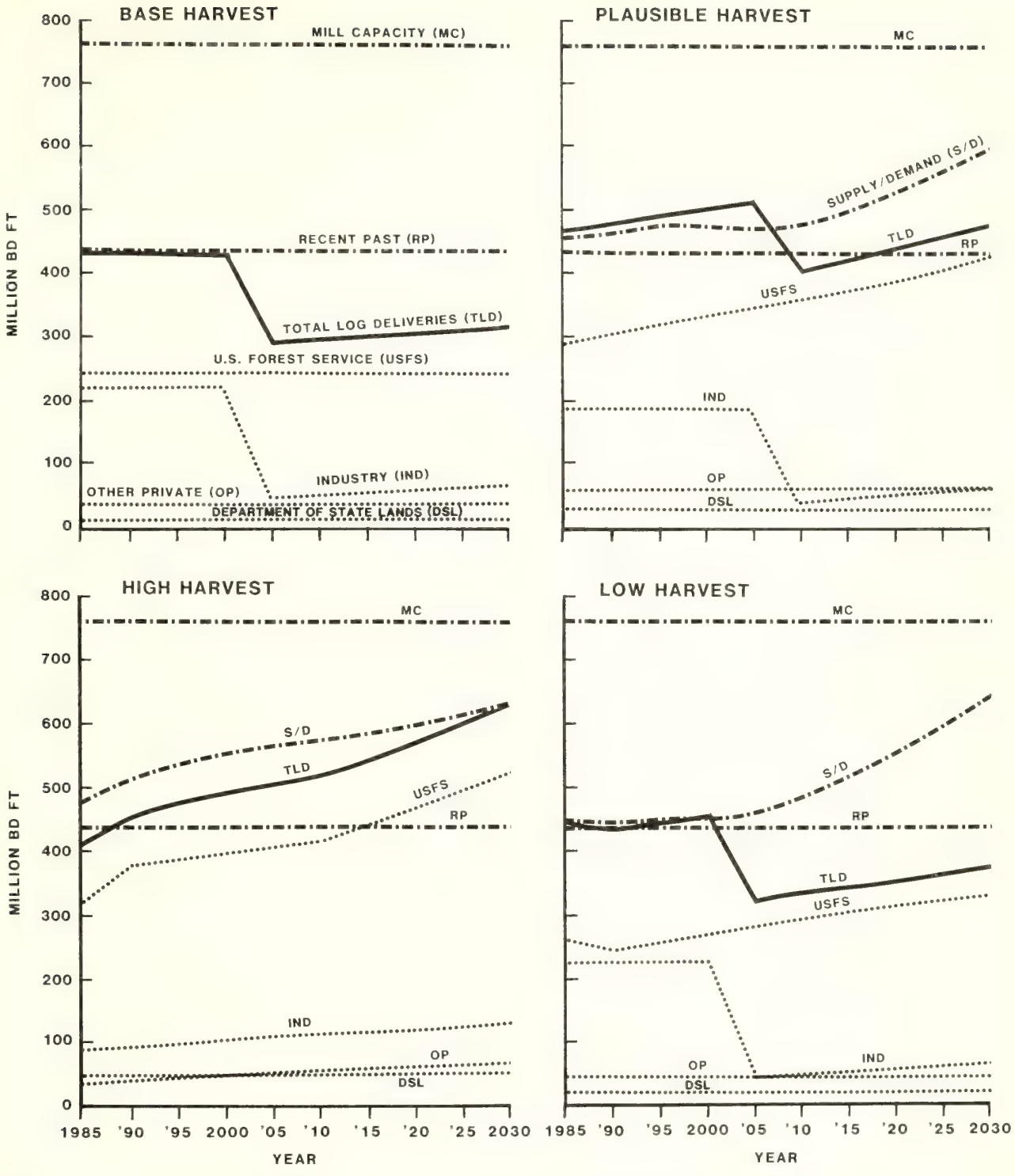

Figure 4—Northwest substate region of Montana: annual timber harvest, log processing, and log delivery levels, by scenario and ownership.

drop below the supply-demand processing levels specified in the Plausible Harvest but equal or exceed all specifications of processing levels for the High Harvest scenario. Problems facing the southwest region will likely surface sometime early in the next century. Declines in total log deliveries not only reflect drops in southwest region industry harvests, but also decreases in log movement from the northwest due to industry harvest decreases there.

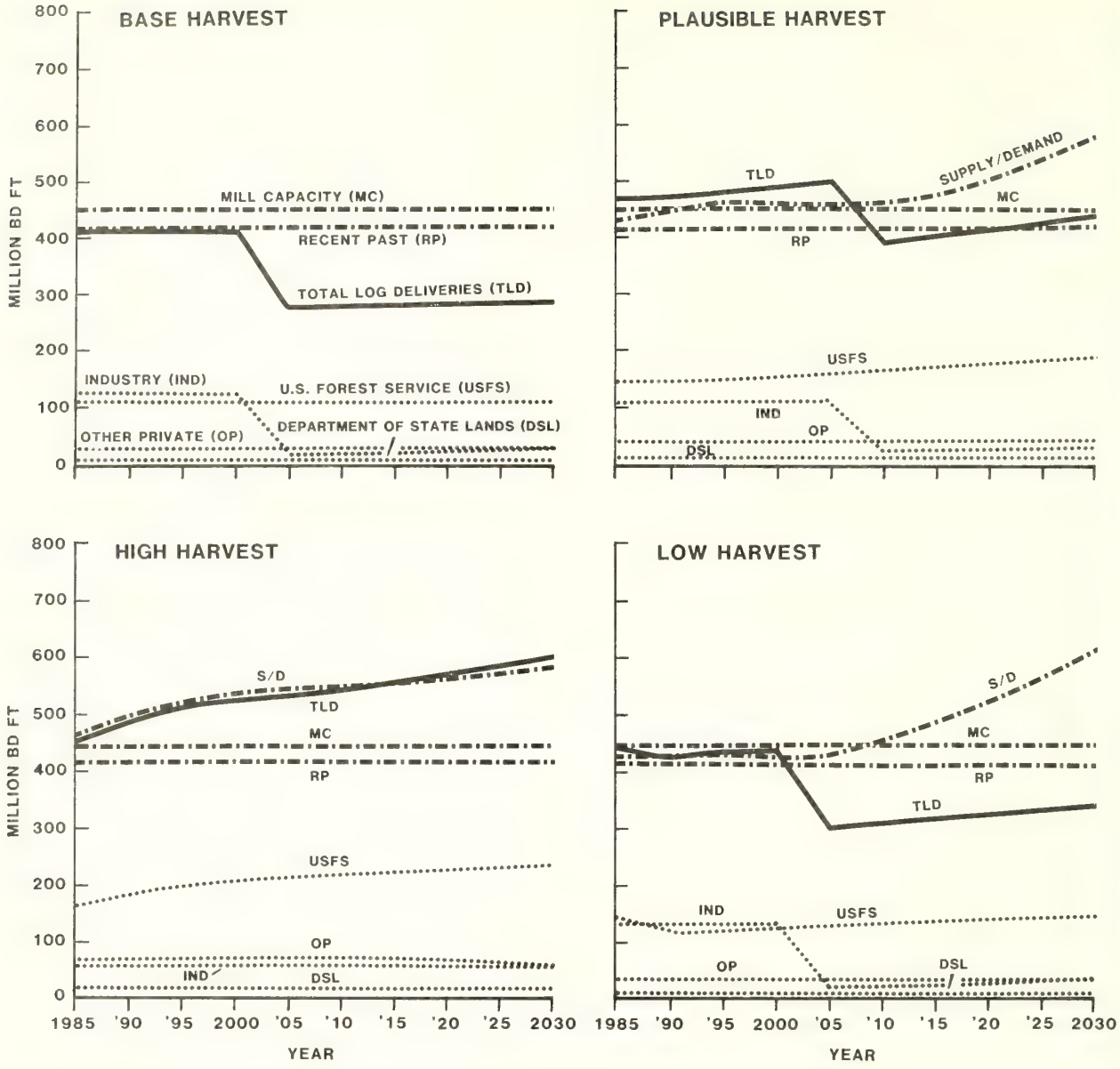

Figure 5—Southwest substate region of Montana: annual timber harvest, log processing, and log delivery levels, by scenario and ownership.

The outlook for the central substate region shown in figure 6 seems to be quite comparable to that of the southwest and brighter than in the northwest. However, the level of timber-oriented activity in the central section is by far the lowest of the three substate regions—roughly half that of the northwest. Under the Base Harvest, log deliveries almost equal that of the recent past processing level (about 140 million bd ft annually). Total deliveries drop slightly after 2000, although harvest levels remain constant. This drop is not due to harvests in the central region, but rather is due to the harvest decline in the southwest shown in figure 5; about 4 percent of that region's harvest is delivered to the central region. While log deliveries in the High Harvest scenario exceed all specifications of processing needs, they are below all specifications in the Low Harvest scenario. The Plausible Harvest scenario is mixed; deliveries always exceed the recent past level of processing (140 million bd ft annually), are always below mill capacity (190 million bd ft annually), and exceed that specified by supply-demand until about 2020 when deliveries drop below.

As in the southwest, and as shown in the High Harvest scenario, opportunities occur for increasing harvest from the nonindustrial private sector. Other noteworthy features include the absence of harvest decline from the forest industry and the relatively greater importance of the nonindustrial private sector in the central region. Given the small variation in harvest from ownerships other than the Forest Service, total deliveries mirror almost perfectly the Forest Service harvest in this region.

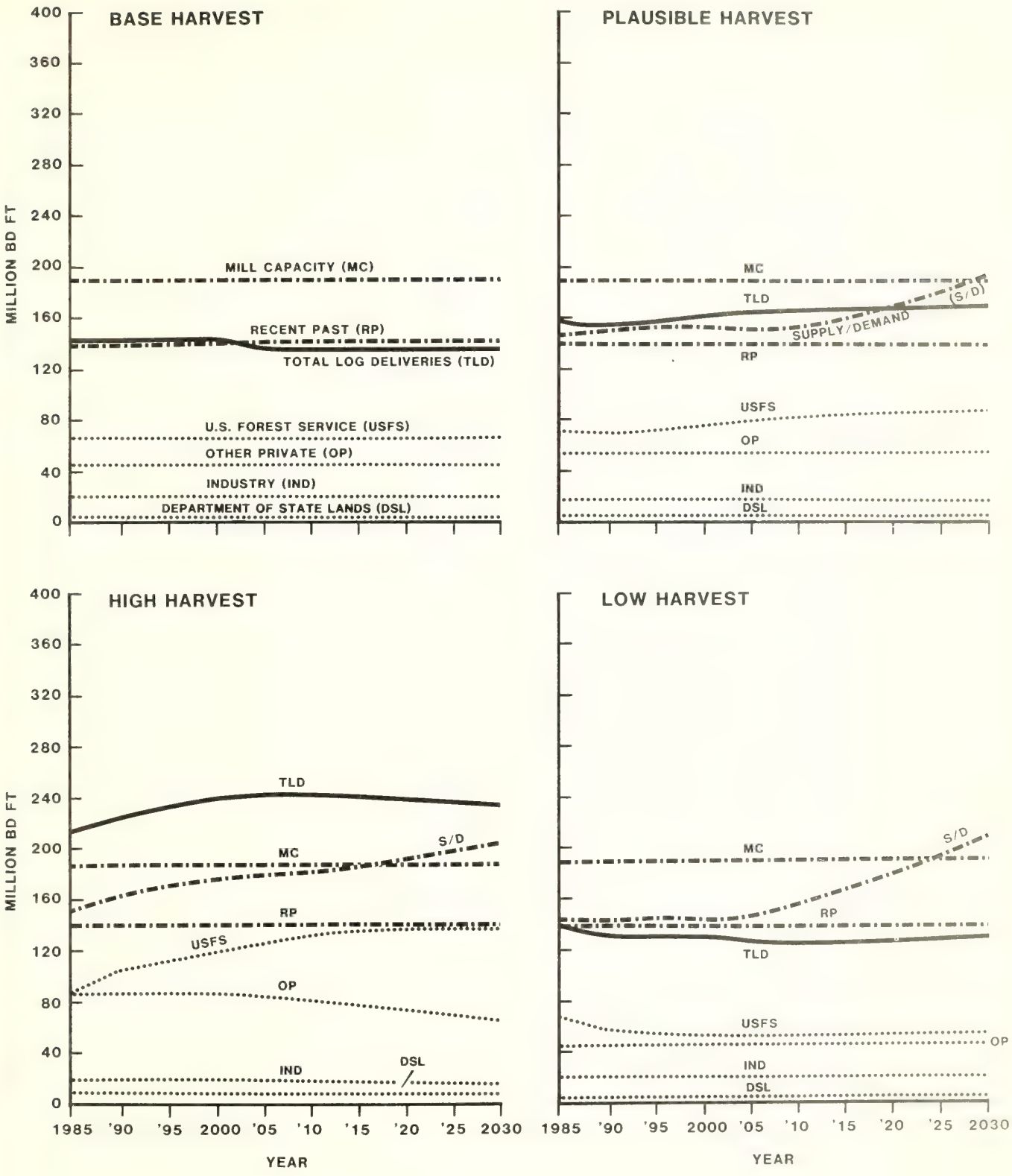

Figure 6—Central substate region of Montana: annual timber harvest, log processing, and log delivery levels, by scenario and ownership.

Inventory Implications

The various future harvest levels evaluated will have differing effects on the physical timber resource, the inventory. Because of data limitations, we cannot describe all inventory implications we feel are appropriate. For example, we recognized species mix as an important descriptor of future harvest, but it was not modeled by the MTMM and therefore cannot be addressed in this study. We use three measures to describe the composition of the future forest: total growing stock, growth-to-cut ratios, and diameter distribution for harvest.

Total Growing Stock—Future growing stock volumes are largely determined by three factors: the initial volume, net growth, and the amount harvested. Initial growing stock volumes for the National Forests vary according to the harvest specification for those lands. Each harvest specification is associated with a different suitable land base as defined by the specific Forest planning alternative. For example, in the High Harvest scenario the initial National Forest volume is at its greatest (largest "suitable" land base) while in the Low Harvest scenario it is lowest (smallest base). Starting volumes for all other owners do not vary by harvest specification because those owners are assumed to be operating from a fixed timber-growing land base.

In all four featured scenarios, statewide board foot growing stock increases over time, although at different rates (fig. 7). The High Harvest scenario shows the lowest rate of increase in growing stock because a higher harvest offsets growth to a greater degree than a lower harvest. It may appear odd, at first glance, that the Base Harvest rather than the Low Harvest scenario shows the greatest rate of increase in growing stock. This is caused by the larger, suitable National Forest land base associated with the Base Harvest scenario. The statewide growing stock levels increase even as industry growing stock is declining through the years 2000 to 2005. This occurs because the growing stock inventory on the National Forests, the other major timber supplier, is increasing at a rate faster than industry growing stock is being depleted. Both the Department of State Lands and nonindustrial private growing stocks remain relatively stable for all four featured scenarios throughout the projection period. All total, Montana's stock of timber, disregarding ownership, is increasing even under the most aggressive harvest scenario.

A sharp upturn occurs in statewide board foot growing stock in all but the High Harvest case. This upturn corresponds to the point when industry shows a sharp decline in its harvest levels, about the year 2000, as shown in figures 4 and 5. If less timber is cut, it follows that the total volume of growing stock will increase. In the High Harvest case, industry harvest is initially set at a much lower level than in the other featured cases. This lower initial level avoids a harvest falloff, and growing stock increases at a relatively steady rate.

The total board foot growing stocks for the individual areas show general upward trends similar to those found statewide. The pattern for most areas and featured scenarios is a decline in industry growing stock and increases for all other owners. One notable exception is the High Harvest scenario where the Department of State Lands and nonindustrial private growing stocks are declining, while industry growing stock is increasing. Also, in the Plausible Harvest scenario, the nonindustrial private growing stock is declining in the northwest region.

Growth-to-Cut Ratios—Growth-to-cut ratios are an index of change in total growing stock. When cut exceeds growth, the ratios will be between 0.0 and 1.0, and growing stock base will be decreasing. Conversely, when growth exceeds cut, the ratios will be greater than 1.0 and total growing stock will be increasing.

Projected statewide ratios reflect the consequences of varying, by scenario, harvest levels and the National Forest suitable land base (fig. 8). In all scenarios, board foot ratios exceed 1.0, indicating that growth exceeds cut. The Base Harvest scenario exhibits the highest ratios, the High Harvest scenario the lowest. This is consistent with the comparison of growing stock levels among scenarios: Base Harvest growing stock is largest and High Harvest stock is lowest. In the Base Harvest scenario in figure 8, a sharp rise occurs between 2000 and 2005, reflecting the sudden drop in harvest on industrial lands. In the High Harvest scenario, statewide ratios decline, indicating that more but not all of the growth will be cut.

When growth-to-cut ratios are compared across ownerships, industry exhibits the lowest ratios, always less than 1.0 over the next few decades in all but the High Harvest scenario. Eventually, industry's ratios rise to 1.0 and remain more or less fixed at that level. This rise occurs after industry removes all commercial timber, and a decrease in harvest occurs. Following the harvest decline, industry can harvest only available merchantable timber—the board foot growth. The Forest Service and Department of State Lands often show the largest ratios, with all nonindustry ratios being generally greater than 1.0, regardless of scenario. Only in the High Harvest scenario do nonindustrial private and Department of State Lands ratios drop below 1.0.

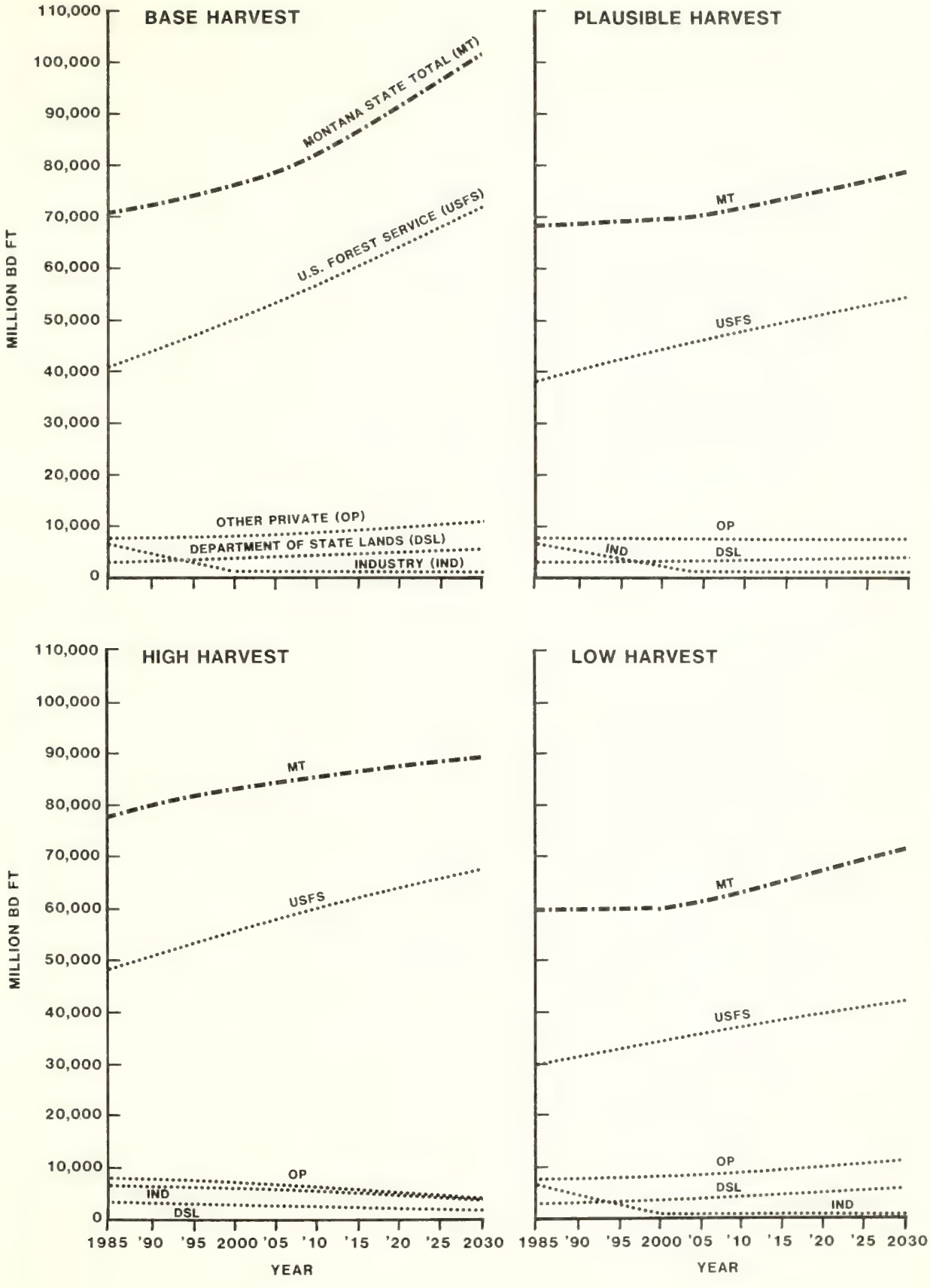

Figure 7—Growing stock volume in Montana, by scenario and ownership.

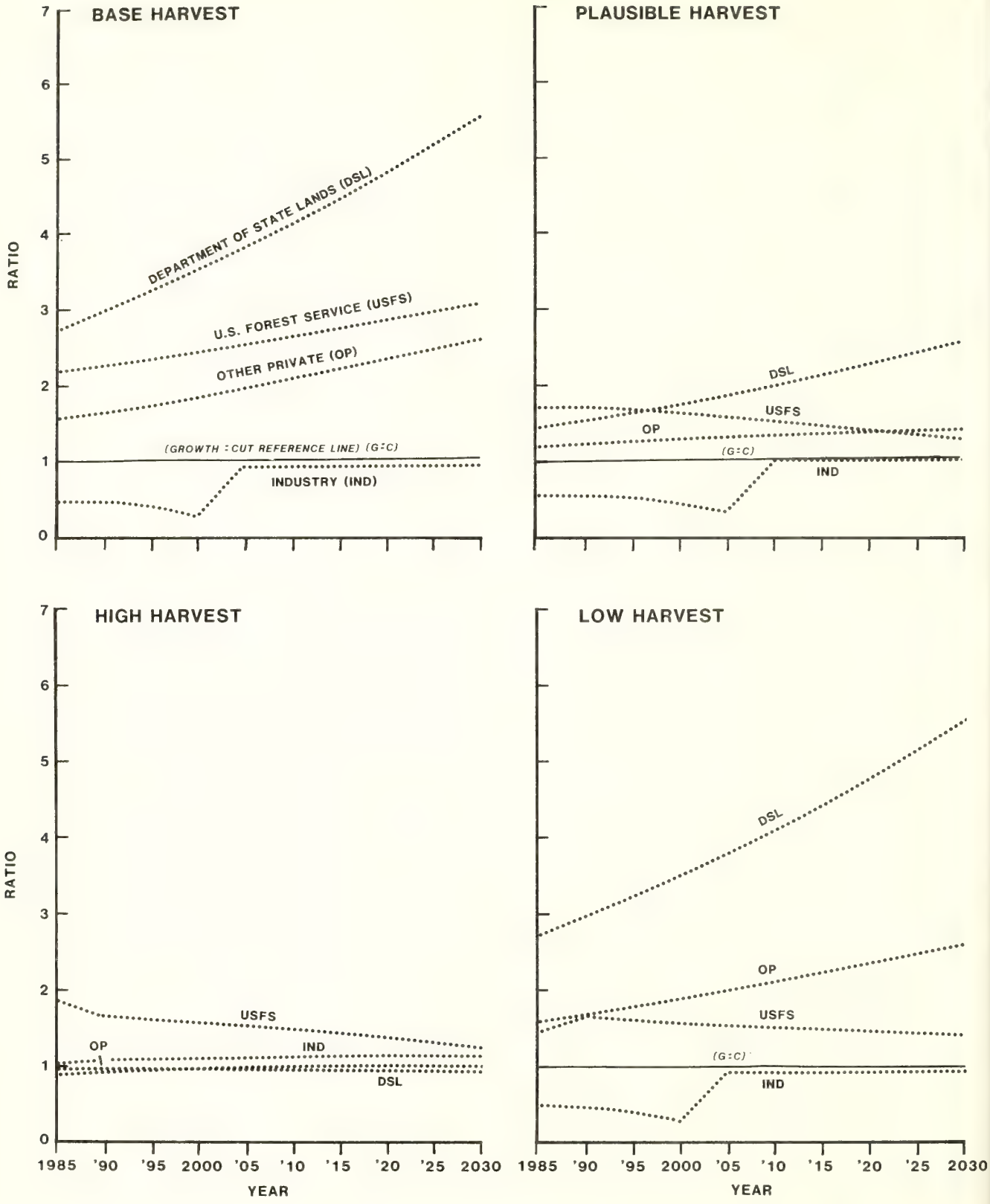

Figure 8—Growth-to-cut ratios in Montana (bd ft), by scenario and ownership.

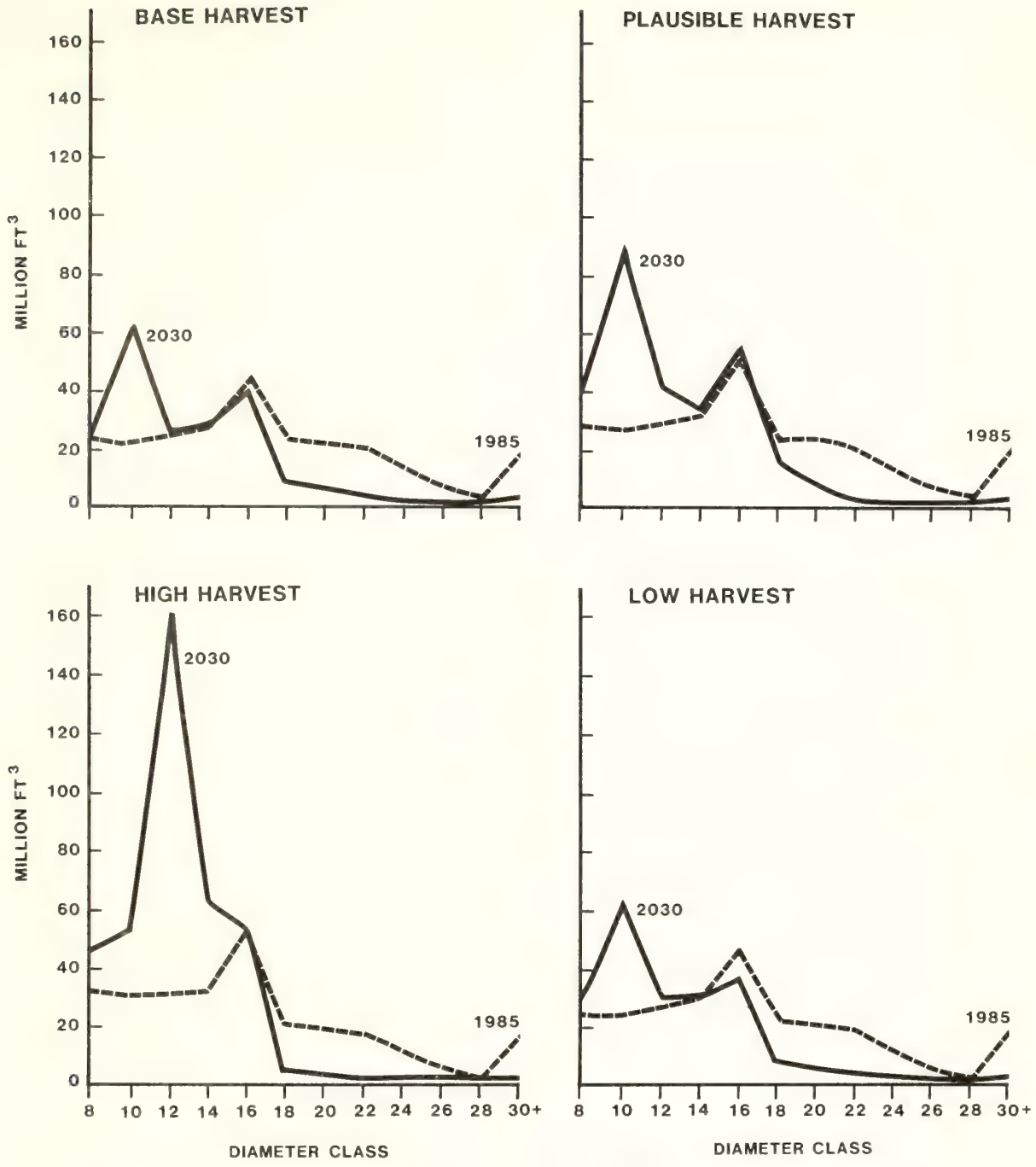

Figure 9—Diameter distribution of harvest in Montana, by scenario and region.

Diameter Distributions—A shift in the future to a harvest of smaller trees is evident when the distribution of volume harvested across diameter classes is compared for 1985 and 2030 harvests (fig. 9). In all scenarios there is a clear shift in the harvest volume to the smaller diameters in 2030. MTMM's harvest simulations show that the bulk of the harvest in 1985 came from 14-inch to 18-inch diameter at breast height (d.b.h.) trees, while in 2030 the majority is expected to come from 8-inch to 12-inch d.b.h. trees. In the featured scenarios, approximately 30 percent of the harvest volume is less than or equal to 12 inches in 1985. That rises to about 60 to 75 percent by 2030.

The change in the diameter of the harvest reflects an overall change in the distribution for the inventory. As harvests continue over the years we can expect our standing forests to be smaller than they are presently. Older growing stock is being removed and replaced by younger and faster growing timber.

Economic Implications

Obvious and perhaps not-so-obvious economic implications are associated with the timber-related scenarios analyzed. The obvious include effects on jobs and income.

The less apparent include effects on local governments through 25 Percent Fund payments, relocation of industry, and the economic quality of life. Many of these implications tend to move together—either improve or get worse. We focus on only two: employment and stumpage prices.

Employment—Timber harvested in Montana provides jobs in logging, sawmills, and other wood-processing sectors. In general, the number of jobs in substate regional economies is proportional to the quantity of timber harvested and milled. Purchases by the forest products industry within the substate regions (indirect effects), along with personal purchases by timber industry employees (induced effects), also generate employment and income in the various trade and service sectors of the local economy. The number of jobs and income resulting from timber harvesting and processing is the sum of the people directly employed, plus the indirect and induced jobs.

Figure 10 shows the total private sector employment generated by the timber harvest projected in the four featured scenarios. The employment shown, including that for 1985 and 1986, is based on harvest volumes simulated by MTMM through the analysis period. Therefore, the employment levels do not correspond to published data for 1985 and 1986. They also are different for each scenario.

According to the MTMM figures, the 1985 Montana timber harvest at the average level of the recent past provides an estimated 14,200 jobs, of which 7,500 are direct jobs in the timber industry. An additional 7,000 indirect and induced jobs result from the economic activity generated by the forest products industry. The 1985 base timber harvest of just over 1,000 million bd ft results in about 14 jobs for every 1 million bd ft of stumpage harvested. The actual employment reported for the forest products industry in 1985 was 9,369 jobs. When converted to total jobs by the appropriate multiplier, this translates to about 17,700 direct, indirect, and induced jobs in 1985. However, even though we just referenced the actual figures, employment projections should be compared among scenarios, not to actual reported employment levels.

In addition to the private sector employment modeled in MTMM, a significant number of jobs in the public sector are required to prepare and administer timber sales on public lands, but these are not modeled. Public sector timber management activities in Montana provide 1,330 direct jobs that also have added indirect and induced effects in the substate economies.

The personal income in the private sector related to the 1985 harvest in the Base Harvest scenario is $583 million annually, and in the Plausible Harvest scenario it is estimated at more than $639 million annually. These employment earnings represent a significant contribution to local and regional economies of Montana. Because most of the forest products manufactured in Montana are shipped out of State, the wages and salaries of workers in the forest products industry are part of the economic base of Montana.

Most timber-related employment is concentrated in the northwest and southwest substate regions of Montana, as shown in the lower portion of each panel in figure 10. Consequently, changes in the level of timber harvest will have a more significant effect on the economies of these two regions. Because the number of jobs related to the timber harvest is proportional to the annual timber harvest, changes in employment over time follow the same trends as the harvest.

For both the Base and the Low Harvest scenarios, only minor changes in employment occur until the year 2000. Then a substantially sharp drop of more than 25 percent occurs over the following decade. After that drop, employment levels increase gradually through 2030. The decrease in employment in the decade following the year 2000 is due to the reduction in harvest by forest industry as timber inventory is depleted. The steepness of the decline in industry harvest is a reflection of the way the MTMM calculates inventory, growth, and harvest. If harvest declines were spread over a longer period, the employment drop would also be more gradual. Increases in harvest on National Forest lands in these two scenarios are not large enough to offset the decrease in harvest by the industrial ownerships. The projected employment declines occur only in the northwest and southwest regions where industry currently is most prevalent.

In contrast, the High Harvest scenario projects a significant, steady increase in employment as harvests increase throughout the analysis period. This scenario begins with a level of employment 10 percent over that associated with the recent past, and by 2030 it ends at a level over 50 percent higher. The most significant increases in employment are in the northwest and southwest, reflecting that harvests would increase the most in these regions.

In the Plausible Harvest scenario, employment begins slightly above that of the recent past and gradually increases until the year 2005. Then employment decreases sharply as industrial harvests decline. Following the decrease, the level of employment, as shown in figure 10, is at recent past levels. For the remainder of the analysis period, employment steadily increases as inventories gradually accumulate and harvests increase, ultimately ending at a level modestly above existing employment levels. Again, the drop beginning in the year 2000 is most significant in the northwest and southwest substate regions.

Stumpage Prices—Supply-demand equations are used to provide estimates of both equilibrium quantity and price. These price estimates are most valid for the scenarios that assume relatively unconstrained supply behavior. Timber harvest levels specified by the inventory share (IS) method best portray that behavior. When the IS method is applied, total harvest (proxy for supply) will exactly equal the processing level (proxy for demand), inventory permitting; reality is then in accord with the supply-demand model's equilibrium solution. In other scenarios where the harvests from the various ownership classes are set at a level below the quantity demanded (as specified by the supply-demand model) there would be upward pressure on prices. There would be downward pressure if harvests were set above the equilibrium quantity. Earlier discussions of surplus and deficit refer only to the mathematical relationship between timber processing and harvest levels.

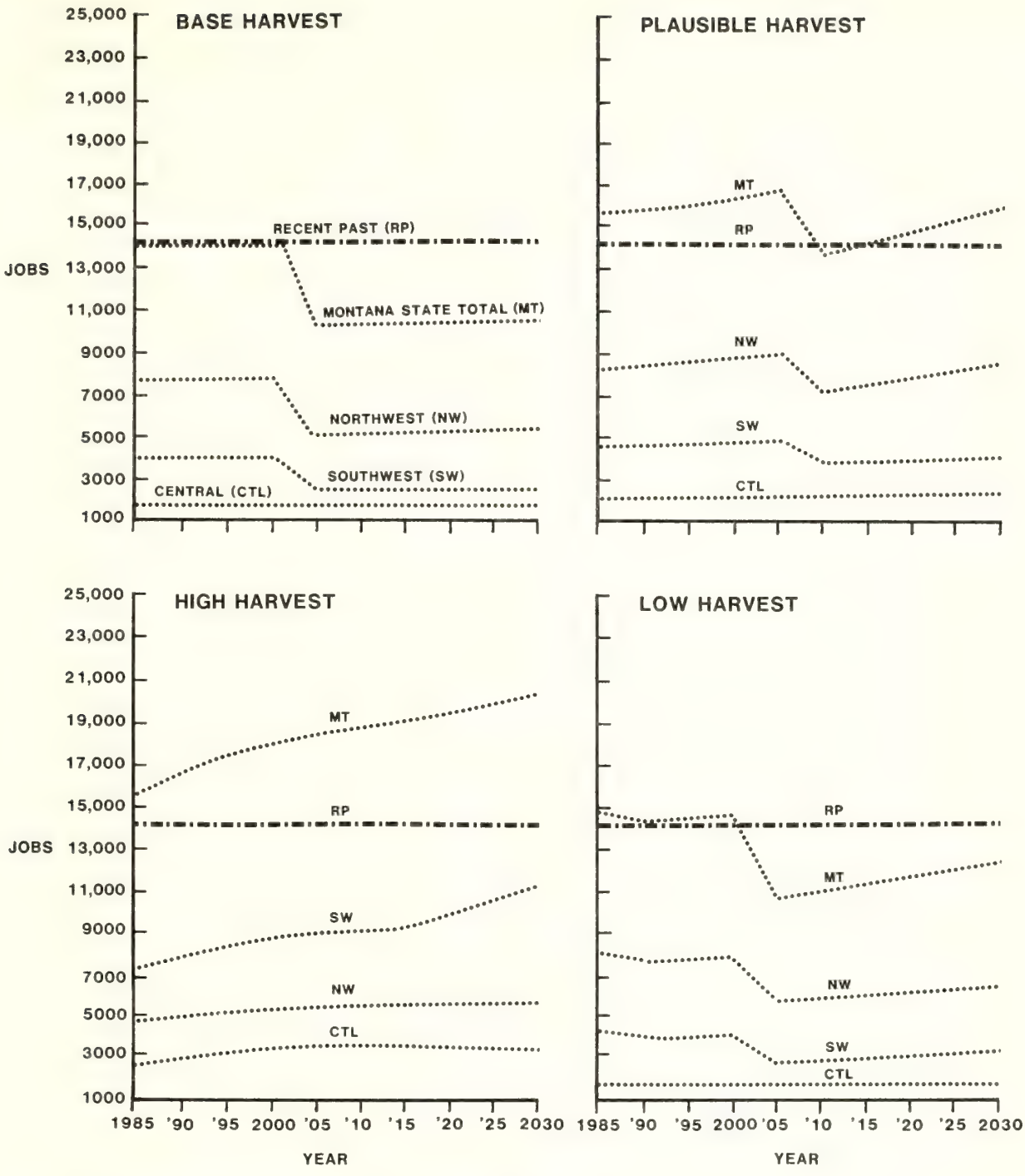

Figure 10—Total timber-related employment, by scenario and region.

Estimates of future stumpage prices can be most meaningfully expressed in relative terms, the rank order of different timber-related scenarios. (Comparisons of absolute dollar levels are not as meaningful and are not discussed in this analysis.) The relative rankings (where 1 = the smallest and 4 = the largest) in terms of the level of stumpage price and size of price change over the period 1985 through 2030 are:

Scenario	Stumpage price ranking	
	Level	Change
Base Harvest	4	4
Plausible Harvest	2	2
High Harvest	1	1
Low Harvest	3	3

As expected, timber-related scenarios with the highest harvest level have the lowest prices and the smallest increase in real dollar values. Scenarios with lower harvest levels, such as the Base Harvest and Low Harvest scenarios, have higher initial prices for stumpage as well as larger increases. The Base Harvest scenario has a larger increase in prices as well as higher prices in general because it actually has a lower harvest in the more distant future than does the Low Harvest scenario. The rate of increase in stumpage prices is not as meaningful and is not displayed because a small increase applied to low initial price can result in high percentage increases. In general, the rate of increase in real prices is consistent with those used in the Resources Planning Act Assessment (Haynes 1986).

The statewide demand for timber is inelastic (Jackson 1983) for the range of prices and volumes considered in this analysis. It follows that increases in stumpage prices result in less-than-proportionate decreases in the quantity of stumpage demanded and that gross stumpage revenue to producers would fall as the volume marketed increases. Conversely, as prices rise, less-than-proportionate decreases in the quantity of stumpage demanded would result in increases in total revenue. These results occur only if all the other variables used to specify the demand and supply model are held constant and there is no shift in demand.

Stumpage revenues to specific ownership classes vary depending on the characteristics of the timber marketed, location factors, and the strength of the local stumpage market. All of the Forest Service planning alternatives considered in this study show some relative increase in the Forest Service's share of the stumpage market and will result in commensurate increases in gross stumpage receipts, even though statewide receipts may be dropping. In the Plausible Harvest and High Harvest scenarios, the increases are substantial. Shifts in total State timber harvest between substate regions in these scenarios mean that the changes in revenues would be most noticeable in the northwest and southwest substate regions.

DISCUSSION

This study sought to assess the extent to which Montana's timber inventory could support various combinations of mill processing and timber harvest levels to the year 2030. The study also measured the effect of these combinations in terms of their inventory and economic implications.

But as in any projection into the the future, the confidence in the assessments decreases as the time horizon is lengthened. In this study, we feel more confident about the quality of our simulated futures over the first two or three decades than over the later two or three decades. Inability to correctly project biological and economic information to 2030 is one source of uncertainty. Another is that land management planning, being a continuing process on National Forests, may create other preferred alternatives during subsequent rounds of planning, altering or eliminating those used in this study.

A number of critical assumptions and limitations should be emphasized:

1. Potential regional supply problems identified here are conditioned by 1980 log flow patterns. Market forces could alter these patterns so that regionally specific surpluses or deficits projected by the model would be reduced. Modifications in log flows (both inside Montana and between Montana and other States and Canada) or the geographical distribution of processing capacity could not be anticipated and modeled in this study. Nevertheless, while some adjustments will almost certainly take place to help alleviate surpluses and deficits, there are limits. For example, distance, terrain, and location of processing centers would probably limit the large-scale movement of logs from the central to the northwest region.

2. In an open market, price change is the mechanism by which supply and demand are brought into equilibrium. Statewide shortages or surpluses resulting in the comparison of predetermined supply with predicted demand should be used for reference and comparison only. We do not expect disequilibrium. Rather, projected surpluses and shortages will be eliminated by price changes and changes in log movements.

3. Not all the total physical inventory was always used in MTMM simulations. In each National Forest planning alternative, only a portion of the total physical timber resource on each Forest is actually included in the alternative's "suitable" land base. Similar reductions in the potential timber land base have been applied to private and Department of State Lands ownerships. If these reductions are overestimated, they will cause an underestimate of future inventory, making future timber scenarios appear unnecessarily bleak. On the other hand, some inventories may have been overstated. For example, we did not account for the fragmented ownership pattern of Department of State Lands resulting in a substantial portion of such lands being physically or economically inaccessible, especially in the central region. Similarly, harvest behavior of the nonindustrial private sector is unpredictable, yet we treated it as a certainty.

4. Overrun, lumber price, and production cost projections all have a dramatic effect on the price and equilibrium quantity projections in the supply-demand model. Therefore, modest errors in these projections will result in gross errors in price and quantity projections.

5. The accuracy of each scenario depends on the indicated harvests actually occurring. For all public agencies the level of timber sold depends on funding for sale preparation and administration as well as construction of access roads. The analyses in this study were made on the basis of volumes provided in the draft Forest Plans and do not reflect any subsequent adjustments that may be made.

6. This study only partially accounts for market forces arising outside Montana. We did not account for any changes in import and export relationships between Montana and nearby States nor changes involving relations with Canada. Similarly, we did not attempt to evaluate implications of national policy changes, such as the change in capital gains tax treatment specified by the 1986 Tax Reform Act.

7. This study did not distinguish between species and their relative desirability or marketability because the timber inventory maintained in MTMM is not species-specific. Our results pertain to a generic cubic or board foot that we assume the mills will want. This approach is compatible with the movement toward a fiber-oriented forest products industry.

8. The growth rates for all ownership classes included in the model are set at those indicated at the present time from timber inventory data. As such, there is no consideration given to future increases in growth rates that could result from past activities or from future cultural activities. Consequently, the inventory futures portrayed in this report are conservative and can be dramatically altered by reaping benefits of cultural practices.

Seven key conclusions can be drawn from this study:

1. The featured scenarios portray strikingly similar futures, regardless of geographical area. The Base and Low Harvest scenarios depict an extension of the recent past until about 2000, when substantial declines occur. The Plausible Harvest scenarios suggest a future that is modestly above or approximates the recent past level of activity. High Harvest scenarios depict modest but constant expansion throughout the analysis.

2. Supply problems are a strong possibility in the northwest region assuming current patterns of log flows continue. Supply problems are likely to be less in the southwest region, unless log flow patterns change to benefit the northwest. This is because, under the current conditions, a substantial amount of the logs processed in the southwest come from timber harvested in the northwest. Supplies in the central region seem to be generally adequate, somewhat above the levels of the recent past. If problems arise, they tend to occur well into the next century, and then only under circumstance of restricted harvest levels or high processing levels.

3. Industrial owners do not appear to have sufficient inventory to maintain their harvest at the level of the recent past. The level of harvest is projected to begin declining about the year 2000 at the latest and decline to a level less than half of current levels in all but the High Harvest scenario. This decline in industry harvest, due to inventory depletion, is most significant in the northwest substate region of Montana, but it is also sizable in the southwest section. However, the MTMM figures probably exaggerate the speed and depth of the decline. More likely, industry harvest will decline in a series of smaller, more prolonged stops as individual owners make adjustments to their inventory.

4. Timber harvest in Montana need not drop below that of the past. Even at harvest levels projected in the Plausible Harvest scenario, total statewide harvest is equal to or above the recent past average for all of the analysis period. The significant declines by industry can be at least partially offset by increases in National Forest harvest, depending on Forest planning decisions. A potential also exists for nonindustrial private owners in the central and southwest regions to increase harvest.

5. Regardless of possible problems between timber harvest and log processing levels, Montana's timber inventory should remain in good shape. Statewide growing stock levels generally increase throughout the analysis period. Moreover, as industry harvest declines, growing stock takes an even greater upturn. Growth-to-cut ratios exceeding 1.0 imply inventory buildup.

6. These trends have many economic implications. Because timber-related employment and income are assumed proportional to timber harvests, and because harvest levels are expected to increase in both the Plausible Harvest and High Harvest scenarios, opportunities may exist for economic development based on the forest products industry. Any expansion would be closely tied to changes in markets, technology, and resource availability—all oriented toward using smaller trees. The other two featured scenarios portray a situation in which, at best, employment levels stay at about current levels. The only possibility for increased employment in those scenarios would be an increase in employment per unit of timber production. However, current trends show decreases in employment per unit of timber production. Substantial increases in real stumpage prices can be expected in all but the High Harvest scenario. In general, the lower the quantity of timber that would be marketed over time, the larger the increase in the real price of stumpage.

7. A shift to harvesting smaller diameter trees is expected. By 2030 harvest will largely come from 8-inch to 12-inch trees rather than from 14-inch to 18-inch trees, as simulated by MTMM for 1985. This shift will have a major impact on Montana's wood products industry both in the woods and in the factory. For one thing, logging costs would be expected to increase because it is generally more costly per unit volume to remove smaller trees than larger trees. This cost increase may be mitigated by increased mechanization in harvesting that is better suited to smaller trees. Also, smaller diameter trees would probably cause major changes in the structure of the wood-processing industry. This would result in closures of mills reliant on large logs (plywood mills and dimension-lumber mills) and openings of mills that could more efficiently use small logs (stud mills and pulp mills). Indeed, this process is already under way.

REFERENCES

Adams, Darius M.; Haynes, Richard W. 1980. The 1980 softwood timber assessment market model: structure, projections, and policy simulations. Forest Science Monograph 22. 64 p.

Carr, William R. 1986. Unpublished data provided by: U.S. Department of Agriculture, Forest Service, Northern Region, Missoula, MT.

Connaughton, Kent; Jackson, David H.; Majerus, Gerard A. [In preparation]. A practical guide to the statistical estimation of the regional supply and demand for timber. Missoula, MT: University of Montana, School of Forestry.

Council of Economic Advisors [CEA]. 1985. Economic report of the President. Washington, DC: U.S. Government Printing Office. 356 p.

Council of Economic Advisors [CEA]. 1986. Economic report of the President. Washington, DC: U.S. Government Printing Office. 378 p.

Green, Alan W.; O'Brien, Renee A.; Schaefer, James C. 1985. Montana's forests. Resour. Bull. INT-38. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 70 p.

Howard, James O.; Fiedler, Carl E. 1984. Estimators and characteristics of logging residue in Montana. Res. Pap. PNW-321. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 29 p.

Haynes, Richard W. 1986. Unpublished data provided by: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, OR.

Inland Forest Resource Council [IFRC]. 1985. Analysis of the Region One timber supply situation: IFRC position on National Forest planning. Unpublished paper supplied by Inland Forest Resource Council, Missoula, MT.

Jackson, David H. 1983. Sub-regional timber demand analysis: remarks and an approach for prediction. Forest Ecology and Management. 5: 109-119.

Jackson, David H. 1984. Divestiture, harvest expansion and economic efficiency: the National Forests in the early 1980's. In: Johnston, George M.; Emerson, Peter M., eds. Public lands and the U.S. economy: balancing conservation and development. Boulder, CO: Westview Press: 133-170.

Keegan, Charles E., III. 1986. Unpublished data provided by: University of Montana, Bureau of Business and Economics Research, Missoula, MT.

Laux, James W. 1986. Unpublished data provided by: U.S. Department of Agriculture, Forest Service, Northern Region, Missoula, MT.

Long, Brian. 1986. Unpublished data provided by: Montana Department of State Lands, Division of Forestry, Missoula, MT.

Majerus, Gerard A. 1982. Econometric estimation of demand and supply curves for timber in Montana, 1962-1980. Missoula, MT: University of Montana. 52 p. M.S. thesis.

Montana Division of Forestry [MDF]. 1986. Unpublished information provided by: Montana Department of State Lands, Division of Forestry, Missoula, MT.

Moore, Paul. 1986. Unpublished data provided by: Montana Department of State Lands, Division of Forestry, Missoula, MT.

Niccolucci, Michael J. 1986. Unpublished data provided by: U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Missoula, MT.

Sieverts, Eric; Palmer, Charles; Walters, Ken; Alward, Greg. 1983. IMPLAN user's guide. Unpublished report by: U.S. Department of Agriculture, Forest Service, Systems Application Unit, Land Management Planning, Fort Collins, CO.

U.S. Department of Agriculture, Forest Service. 1981. An assessment of the forest and rangeland in the United States. For. Resour. Rep. 22. Washington, DC: U.S. Department of Agriculture, Forest Service. 352 p.

U.S. Department of Agriculture, Forest Service. 1984. Montana timber demand and supply: a short-run model of the timber market and an assessment of the economy, employment and fuel wood use. Unpublished report to the Montana State Forester from U.S. Department of Agriculture, Forest Service, Northern Region, Missoula, MT.

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Flowers, Patrick J.; Brickell, James E.; Green, Alan W.; Hyde, James F. C., III; Jackson, David H.; Raettig, Terry L.; Schuster, Ervin G.; Wood, William L. 1987. Montana's timber supply: an inquiry into possible futures. Resour. Bull. INT-40. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 22 p.

A simulation model was used to evaluate the potential for future timber harvest levels to meet various expectations of log processing needs and to assess associated inventory and economic impacts in Montana. For the State as a whole, future harvest levels appear to be adequate to accommodate a range of log processing levels. Harvest levels may not meet future log processing needs in the northwest region of Montana. A reduction in statewide industrial harvest appears inevitable. Growing stock inventories will generally increase. A shift in harvest to substantially smaller timber is expected. Stumpage prices are expected to increase.

KEYWORDS: timber, supply and demand, economic analysis

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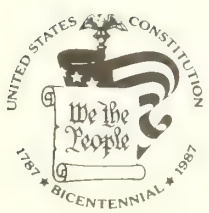

United States
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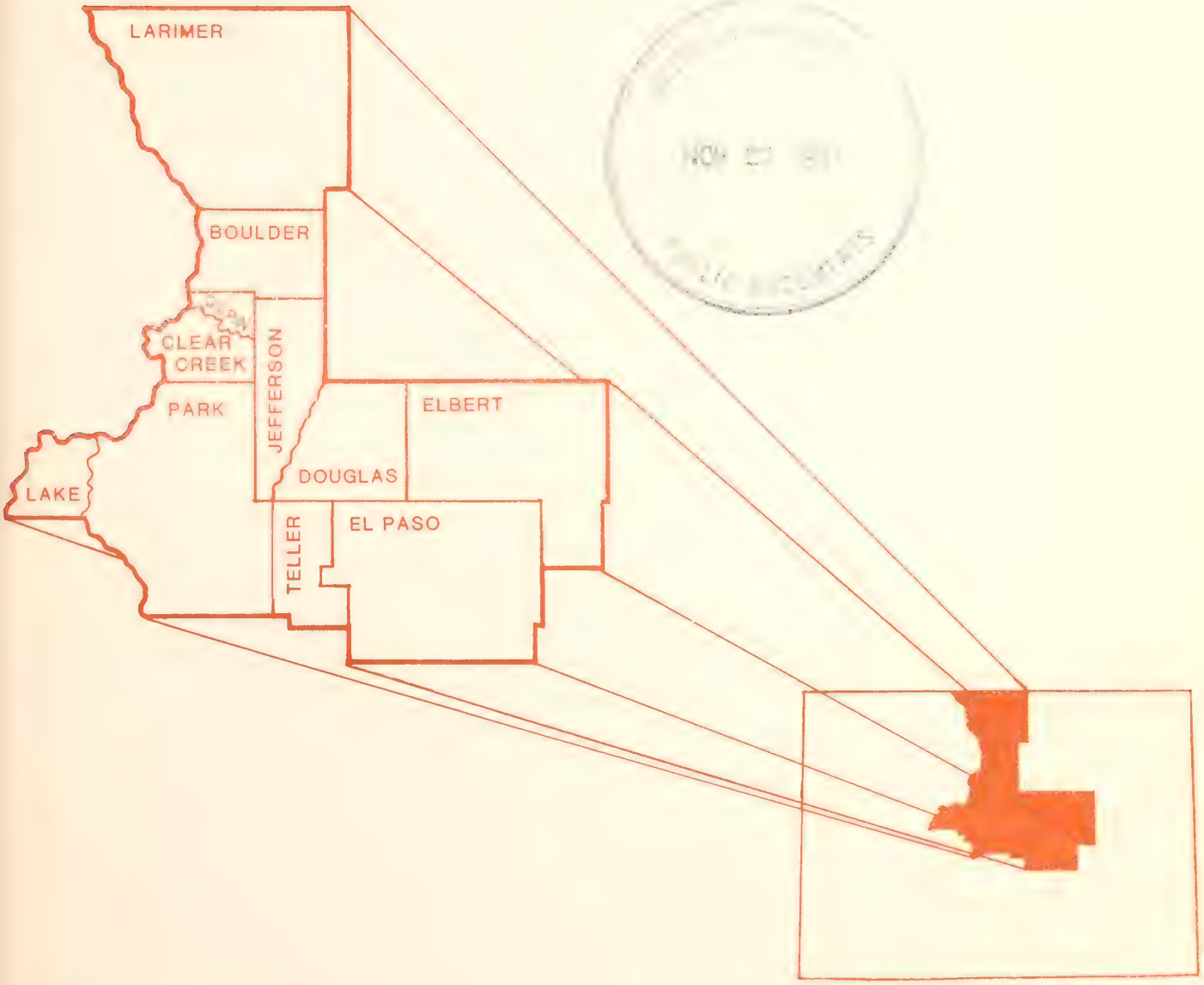
Forest Service

**Intermountain
Research Station**

Resource
Bulletin
INT-41

Colorado's Northern Front Range: Forest Statistics for State and Private Land, 1983

**Roger C. Conner
Shirley H. Waters**



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RESEARCH SUMMARY

Colorado's northern Front Range contains over 1 million acres of timberland and 63,000 acres of woodland. Productivity on the majority of the timberland is low with an average net annual growth of about 22 cubic feet per acre per year for 1982. Timberland sawtimber volume totals about 3.0 billion board feet (International ¼-inch rule). Industrial roundwood harvest was over 2 million cubic feet. Fuelwood harvest from woodland was more than 19 million cubic feet.

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Colorado's Northern Front Range: Forest Statistics for State and Private Land, 1983

Roger C. Conner
Shirley H. Waters

INTRODUCTION

This resource bulletin reports the findings of the Forest Survey inventory of a sample area defined as State and private lands in Boulder, Clear Creek, Douglas, Elbert, El Paso, Gilpin, Jefferson, Lake, Larimer, Park, and Teller Counties of the northern Front Range in Colorado (fig. 1). The two-phase survey began with prefield work in June 1981. The field phase involved, in whole or in part, the summers of 1981 to 1984 with the bulk of the data collected in 1982.

The data in this report pertain only to the State and private forest resources of the counties listed above. Data for lands administered by various public agencies such as National Forest Systems and Bureau of Land Management will be included in a subsequent, comprehensive statewide report that will include all lands and all owners.

The primary objective of Forest Survey—a continuing, nationwide undertaking of the Forest Service, U.S.

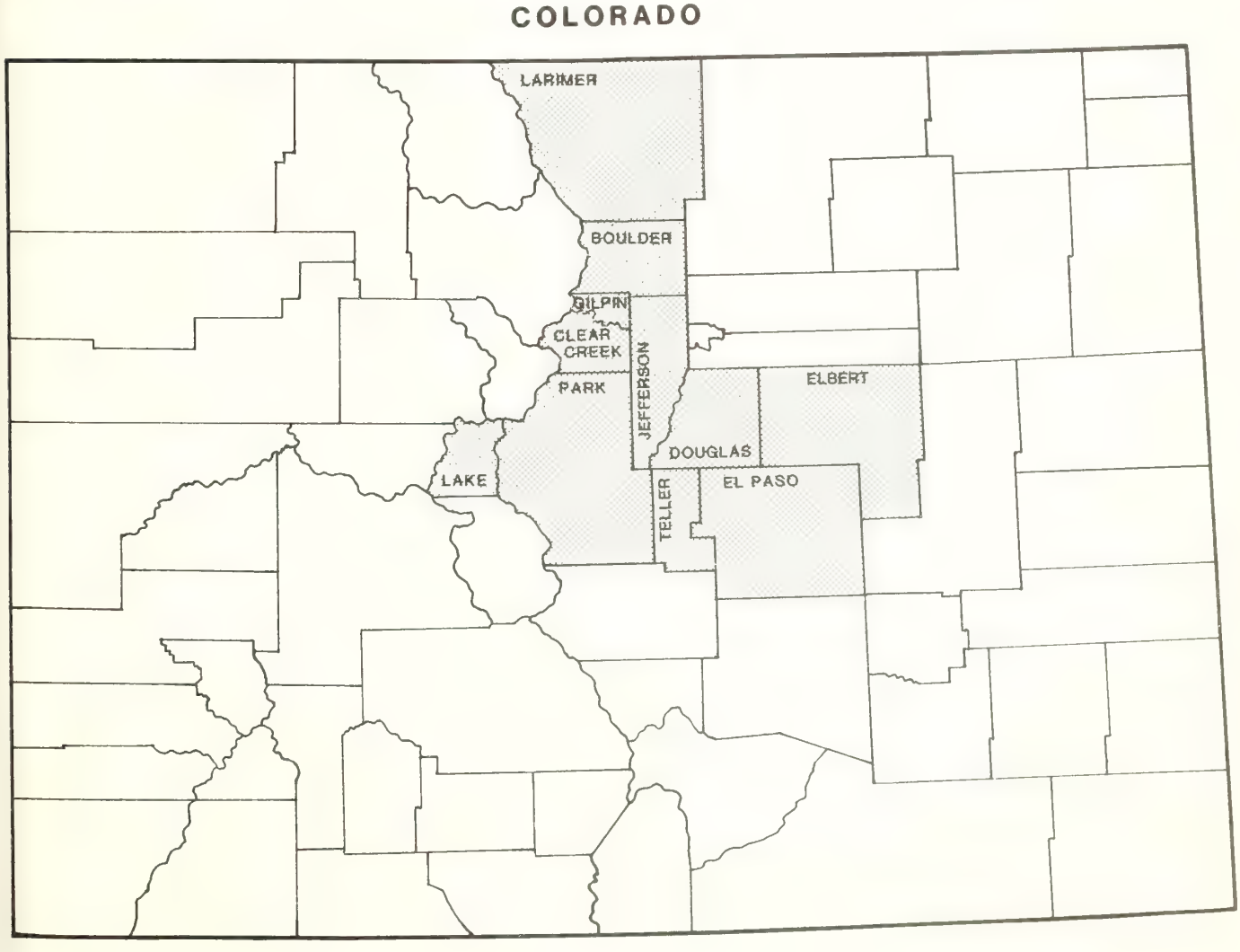

Figure 1—Counties covered by this report.

Department of Agriculture—is to provide an assessment of the renewable resource situation for forest and rangelands of the Nation. Fundamental to the accomplishment of the objective are the periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

The Intermountain Research Station with headquarters in Ogden, UT, conducts the forest resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, western South Dakota, Utah, Wyoming, western Texas, and Oklahoma's Panhandle. These inventories provide information on the extent and condition of State and privately owned forest lands and most other lands not in the National Forest System, volume of timber, and rates of timber growth, removals, and mortality.

These data, when combined with similar information on National Forest lands, provide a basis for forming forest policies and programs and for the orderly development and use of the resources.

HIGHLIGHTS

Area

- State and private lands account for nearly 5.1 million acres, 63 percent of the total land area in Colorado's northern Front Range (fig. 2).
- Forests occupy over 1.1 million acres including reserved land, or 22 percent of the total State and private land area.
- Of the forest land, more than 1 million acres, 93 percent, are classified as nonreserved timberland.
- The remainder of the nonreserved forest land, some 63,000 acres, is classified as woodland.
- Private ownership accounts for 94 percent of both the timberland and woodland areas.
- Ponderosa pine, Douglas-fir, lodgepole pine, and aspen are the predominant forest types and make up 91 percent of the timberland area.
- Oak is the predominant forest type on woodland, occurring on 67 percent of the woodland area.

Inventory

- Timberland growing-stock volume amounts to 963 million cubic feet which includes a sawtimber volume of about 3.0 billion board feet (International ¼-inch rule).
- The majority of the timberland growing-stock volume is ponderosa pine (44 percent), Douglas-fir (18 percent), lodgepole pine (16 percent), and Engelmann spruce (11 percent). The remaining percentage is made up of six other species.
- Volume on woodland amounts to 16 million cubic feet, 50 percent of which is pinyon and juniper species, woodland hardwoods (48 percent), and other softwoods (2 percent).
- About 95 percent of the timberland growing-stock and sawtimber volumes is privately owned.
- Of the growing-stock volume, 77 percent is in trees less than 15 inches diameter at breast height (d.b.h.).
- Of the sawtimber volume, 78 percent is in trees less than 17 inches d.b.h.

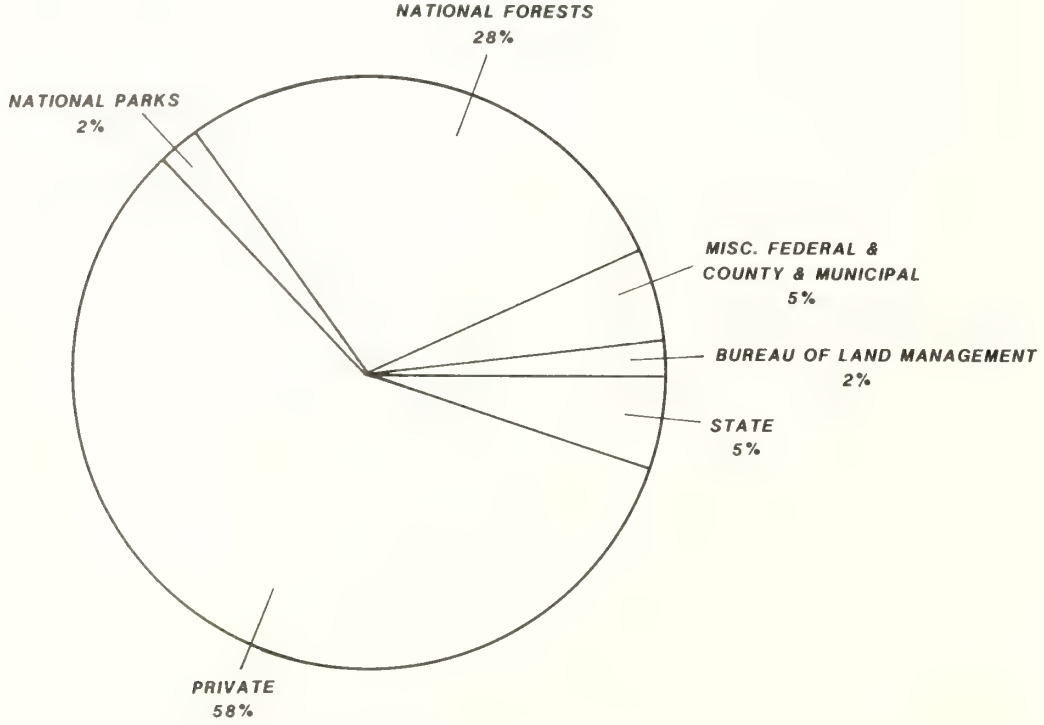

Figure 2—Distribution of land area in Colorado's northern Front Range by owner.

- Less than 4 percent of the timberland area is at least medium to fully stocked with desirable trees, and over a fifth of the area, 217,000 acres, is made up of high-risk old-growth stands.
- Only 9 percent of the timberland area is capable of producing 50 cubic feet of wood per acre per year. Net annual growth for 1982 was about 22 cubic feet per acre per year.
- Nearly 38.5 million cubic feet of volume on timberland is in cull and salvable dead trees, with less than 5 percent of this volume in rotten cull trees.

Components of Change

Growth

- Net annual growth was approximately 22.4 million cubic feet for timberland and 378,000 cubic feet for woodland in 1982.
- Private land contains 95 percent of the timberland net growth and 96 percent of the woodland net growth.

Mortality

- Engelmann spruce accounts for more than 1.7 million board feet (International ¼-inch rule), 47 percent of the sawtimber mortality.
- Annual mortality on timberland of over 1.1 million cubic feet offsets 5 percent of the gross annual growth.

Removals

- An estimated 2.3 million cubic feet of industrial roundwood was harvested in 1982. Of this, 33 percent came from State and private lands (McLain 1985).
- Of the total board-foot volume harvested, 28 percent (about 3.6 million board feet, International ¼-inch rule) was cut from State and private land.
- Ponderosa pine accounted for nearly 57 percent of the total industrial roundwood harvest, with lodgepole pine (18 percent) and Douglas-fir (14 percent) adding to the total (includes all land owners in the sample area).
- Total fuelwood harvest was over 241,000 cords (about 19.3 million cubic feet), of which 67 percent was cut from State and private lands (McLain and Booth 1985). This was more than eight times the industrial roundwood harvest.
- Ponderosa pine made up nearly 65 percent of the fuelwood harvest with aspen (10 percent), lodgepole pine (8 percent), and pinyon and juniper (7 percent combined) adding to the remainder (McLain 1985) (includes all land owners in the sample area).
- Dead trees accounted for 83 percent of the fuelwood harvested from State and private lands (nearly 135,000 cords) (McLain 1985).

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics at the State and sample area levels.

Prefield

Primary area estimates were based on the classification of 32,873 sample points systematically placed on the latest aerial photographs available. The photo points, adjusted to meet known land areas, were used to stratify and compute area expansion factors for the field sample data.

Field

Land classification and estimates for timber characteristics and volume were based on observations, measurements, or both recorded at 944 ground sample locations, of which 258 were forested. Sample trees were selected using a 5-point sample cluster, which included 1/300-acre fixed radius plots for trees less than 5 inches d.b.h., and 40 basal area factor variable radius plots for trees 5 inches d.b.h. or larger.

Compilation

All photo and field data were loaded onto tape and stored for computer editing, computation, and tabulation. Final estimates from these data were based on statistical summaries, a portion of which is included in this bulletin. Volume and defect were computed using equations developed by Edminster and others (1980, 1981), Kemp (1958), Chojnacky (1985), Meyers (1964), and Meyers and others (1972).

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on small sample sizes, resulting in high sampling errors. The standard error percentages shown in tables 1 and 2 were calculated at the 67 percent confidence level.

TERMINOLOGY AND DATA TABLES

The following section contains definitions that are relevant to the timber resource data presented in this resource bulletin. Forest area and timber resource data for Colorado's northern Front Range are displayed in tables 3 through 59.

TERMINOLOGY

Acceptable tree—A growing-stock tree meeting specified standards of size and quality, but not qualifying as a desirable tree.

Area condition class—A classification of timberland reflecting the degree to which the site is being utilized by growing-stock trees and other conditions affecting current and prospective timber growth (see Stocking):

Class 10—Areas fully stocked with desirable trees and not overstocked.

Class 20—Areas fully stocked with desirable trees but overstocked with all live trees.

Class 30—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees, or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees, or both.

Class 40—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees, or conditions that ordinarily prevent occupancy by desirable trees, or both.

Class 50—Areas poorly stocked with desirable trees but fully stocked with growing-stock trees.

Class 60—Areas poorly stocked with desirable trees but with medium to full stocking of growing-stock trees.

Class 70—Areas nonstocked or poorly stocked with desirable trees and poorly stocked with growing-stock trees.

Class 80—Low-risk old-growth stands.

Class 90—High-risk old-growth stands.

Nonstocked—Areas less than 10 percent stocked with growing-stock trees.

Basal area—The cross-sectional area of a tree expressed in square feet. For timber species the calculation is based on diameter at breast height (d.b.h.); for woodland species it is based on diameter at root collar (d.r.c.).

Cord—A pile of stacked wood equivalent to 128 cubic feet of wood and air space having standard dimensions of 4 by 4 by 8 feet.

Cull tree—A live tree that is unmerchantable now or prospectively (see Rough tree and Rotten tree).

Cull volume—Portions of a tree's volume that are not usable for wood products because of rot, form, missing material, or other cubic-foot defect. Form and sound defects include severe sweep and crook, forks, extreme form reduction, large deformities, and dead material.

Deferred forest land—Forest land within the National Forest System that is under study for possible inclusion in the Wilderness System.

Desirable tree—A growing-stock tree (1) having no serious defect in quality to limit present or prospective use for timber products, (2) of relatively high vigor, and (3) containing no pathogens that may result in death or serious deterioration within the next decade.

Diameter at breast height (d.b.h.)—Diameter of the stem measured at 4.5 feet above the ground.

Diameter at root collar (d.r.c.)—Diameter equivalent at the point nearest the ground line that represents the basal area of the tree stem or stems.

Diameter classes—Tree diameters, either d.b.h. or d.r.c., grouped into 2-inch classes labeled by the midpoint of the class.

Farmer-owned land—Land owned by a person who operates a farm and who either does the work or directly supervises the work.

Forest industry land—Land owned by companies or individuals operating a primary wood-processing plant.

Forest land—Land at least 10 percent stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.

Forest tree—A woody plant having a well-developed stem or stems, usually more than 12 feet in height at maturity, with a generally well-defined crown.

Forest type—A classification of forest land based upon and named for the tree species presently forming a plurality of live-tree stocking.

Growing-stock tree—A live sawtimber tree, poletimber tree, sapling, and seedling of timber species meeting specified standards of quality and vigor; excludes cull trees.

Growing-stock volume—Net cubic-foot volume in live growing-stock trees from a 1-foot stump to a minimum 4-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.

Growth—See definition for Net annual growth.

Hardwood tree—A dicotyledonous tree, usually broad-leaved and deciduous.

High-risk old-growth stand—A timber stand over 100 years old in which the majority of the trees are not expected to survive more than 10 years.

Indian land—Indian land held in trust by the Federal Government.

Industrial wood—All commercial roundwood products except fuelwood.

Land area—The area of dry land and land temporarily or partially covered by water such as marshes, swamps, river flood plains, streams, sloughs, estuaries, and canals less than 120 feet wide; and lakes, reservoirs, and ponds less than 1 acre in size.

Logging residues—The unused portions of growing-stock trees cut or killed by logging.

Low-risk old-growth stand—A timber stand over 100 years old in which the majority of the trees are expected to survive more than 10 years.

Miscellaneous Federal land—Land administered by Federal agencies other than the Forest Service, U.S. Department of Agriculture, or Bureau of Land Management, U.S. Department of the Interior.

Mortality—The net volume of growing-stock trees that have died from natural causes during a specified period.

National Forest land—Public land administered by the Forest Service, U.S. Department of Agriculture.

National Resource land—Public land administered by the Bureau of Land Management, U.S. Department of the Interior.

Net annual growth—The net average annual increase in the volume of trees during a specified period.

Net volume in board feet—The gross board-foot volume in the sawlog portion of growing-stock trees, less deductions for cull volume.

Net volume in cubic feet—Gross cubic-foot volume in the merchantable portion of trees less deductions for cull volume. For timber species, volume is computed for the merchantable stem from a 1-foot stump to a minimum 4.0-inch top diameter outside bark, or to the point where the central stem breaks into limbs. For woodland species, volume is computed outside bark (o.b.) for all woody material above d.r.c. that is larger than 1.5 inches in diameter o.b.

Nonforest land—Land that does not currently qualify as forest land.

Nonindustrial private—All private ownerships except forest industry.

Nonstocked area—Forest land less than 10 percent stocked with live trees.

Old-growth stand—A stand of timber species over 100 years old.

Other private land—Privately owned land other than forest industry or farmer-owned.

Other public land—Public land administered by agencies other than the Forest Service, U.S. Department of Agriculture.

Other removals—The net volume of growing-stock trees removed from the inventory by cultural operations such as timber-stand improvement, by land clearing, and by changes in land use, such as a shift to wilderness.

Poletimber stand—A stand at least 10 percent stocked with growing-stock trees, in which half or more of the stocking is sawtimber or poletimber trees or both, with poletimber stocking exceeding that of sawtimber (see definition for Stocking).

Poletimber tree—A live tree of timber species at least 5 inches d.b.h. but smaller than sawtimber size.

Potential growth—The average net annual cubic-foot growth per acre at culmination of mean annual growth attainable in fully stocked natural stands.

Primary wood-processing plants—Plants using roundwood products such as sawlogs, pulpwood bolts, veneer logs, etc.

Productivity class—A classification of forest land in terms of potential growth.

Removals—The net volume of growing-stock trees removed from the inventory by harvesting, cultural operations, land clearings, or changes in land use.

Reserved forest land—Forest land withdrawn from tree utilization through statute or administrative designation.

Residues:

Coarse residues—Plant residues suitable for chipping, such as slabs, edgings, and ends.

Fine residues—Plant residues not suitable for chipping, such as sawdust, shavings, and veneer clippings.

Plant residues—Wood materials from primary manufacturing plants that are not used for any product.

Rotten tree—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot) and with more than half of the cull volume attributable to rotten or missing material.

Rough tree—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot) and with less than half of the cull volume attributable to rotten or missing material.

Roundwood—Logs, bolts, or other round sections cut from trees.

Salvable dead tree—A standing or down dead tree that is currently merchantable by regional standards.

Sapling—A live tree of timber species 1 to 4.9 inches d.b.h. or woodland species 1 to 2.9 inches d.r.c.

Sapling and seedling stand—Timberland stand at least 10 percent stocked on which more than half of the stocking is saplings or seedlings or both.

Sawlog portion—That part of the bole of sawtimber trees between a 1-foot stump and the sawlog top.

Sawlog top—The point on the bole of sawtimber trees above which a sawlog cannot be produced. The minimum sawlog top is 7 inches diameter o.b. for softwoods and 9 inches diameter o.b. for hardwoods.

Sawtimber stand—A stand at least 10 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees or both, and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber tree—A live tree of timber species meeting regional size and defect specifications. Softwood trees must be at least 9 inches d.b.h. and hardwood trees 11 inches d.b.h.

Sawtimber volume—Net volume in board feet of the sawlog portion of live sawtimber trees.

Seedling—An established live tree of timber species less than 1 inch d.b.h. or woodland species less than 1 inch d.r.c.

Softwood tree—A monocotyledonous tree, usually evergreen, having needle or scalelike leaves.

Standard error—An expression of the degree of confidence that can be placed on an estimated total or average obtained by statistical sampling methods. Standard errors do not include technique errors that could occur in photo classification of areas, field measurements, or compilation of data.

Stand-size classes—A classification of forest land based on the predominant size of trees present (see Sawtimber stand, Poletimber stand, and Sapling and seedling stand).

State, county, and municipal land—Land administered by States, counties, or local public agencies, or land leased by these governmental units for more than 50 years.

Stocking—An expression of the extent to which growing space is effectively utilized by present or potential growing-stock trees of timber species. Percentage stocking is the ratio of actual stocking to full stocking for comparable sites and stands, using basal area as the basis for comparison.

Timberland—Forest land where timber species make up at least 10 percent stocking.

Timber species—Tree species traditionally used for industrial wood products. In the Rocky Mountain States, these include aspen and cottonwood hardwood species and all softwood species except pinyon and juniper.

Timber stand improvement—Treatments such as thinning, pruning, release cutting, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.

Upper-stem portion—That part of the main stem or fork of sawtimber trees above the sawlog top to a minimum top diameter of 4 inches o.b. or to the point where the main stem or fork breaks into limbs.

Water—Streams, sloughs, estuaries, and canals more than 120 feet wide, and lakes, reservoirs, and ponds more than 1 acre in size at mean high water level.

Wilderness—An area of undeveloped land currently included in the Wilderness System, managed so as to preserve its natural conditions and retain its primeval character and influence.

Woodland—Forest land where timber species make up less than 10 percent stocking.

Woodland species dead volume—Net volume of dead woodland trees and dead net volume portion of live woodland tree species.

Woodland species live volume—Net cubic-foot volume in live woodland tree species.

Woodland species—Tree species not usually converted into industrial wood products. Common uses are fuelwood, fenceposts, and Christmas trees.

REFERENCES

Chojnacky, David C. 1985. Pinyon-juniper volume equations for the central Rocky Mountain States. Res. Pap. INT-339. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 27 p.

Edminster, Carleton B.; Mowrer, H. Todd; Hinds, Thomas E. 1981. Volume tables and point-sampling factors for aspen in Colorado. Res. Pap. RM-232. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.

Edminster, Carleton B.; Beeson, Robert T.; Metcalf, Gary E. 1980. Volume tables and point-sampling factors for ponderosa pine in the Front Range of Colorado. Res. Pap. RM-218. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 14 p.

Kemp, Paul D. 1958. Volume tables. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station, Ogden, UT.

McLain, William H. 1985. Colorado's industrial roundwood production and mill residues, 1982. Resour. Bull. INT-35. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 13 p.

McLain, William H.; Booth, Gordon D. 1985. Colorado's 1982 fuelwood harvest. Resour. Bull. INT-36. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 11 p.

Meyers, Clifford A. 1964. Volume tables and point-sampling factors for lodgepole pine in Colorado and Wyoming. Res. Pap. RM-6. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.

Meyers, Clifford A.; Edminster, Carleton B. 1972. Volume tables and point-sampling factors for Engelmann spruce in Colorado and Wyoming. Res. Pap. RM-95. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 23 p.

FOREST SURVEY TABLES

Table 1.--Area of State and privately owned forest land with percent standard error in Colorado's northern Front Range, 1983

Item	Softwoods		Hardwoods		All types	
	Acres	Percent standard error	Acres	Percent standard error	Acres	Percent standard error
Timberland	903,441	±3.5	132,882	±17.8	1,036,323	±2.8
Woodland	17,047	±45.6	46,137	±21.0	63,184	±17.8
Reserved forest land:[1]						
Timberland	13,543		2,194		15,737	
Woodland	231		1,372		1,603	
Total forest land	934,262		182,585		1,116,847	

[1]Reserved land areas are estimated from aerial photos without field verification; therefore, standard errors are not calculated.

Table 2.--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on State and privately owned timberland with percent standard error in Colorado's northern Front Range.

Item	Softwoods		Hardwoods		All species	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume, 1983:						
Growing stock (M cubic feet)	897,095	± 6.1	66,428	±21.4	963,523	± 5.7
Sawtimber[1] (M board feet)	2,946,495	± 7.8	37,316	±32.9	2,983,811	± 7.8
Sawtimber[2] (M board feet)	2,485,156	± 7.9	32,015	±33.8	2,517,171	± 7.8
Net annual growth, 1982:						
Growing stock (M cubic feet)	20,006	± 7.9	2,354	±28.4	22,360	± 7.6
Sawtimber[1] (M board feet)	86,782	±10.9	5,359	±84.5	92,141	±11.4
Sawtimber[2] (M board feet)	71,543	±10.3	4,619	±84.3	76,162	±11.0
Annual mortality, 1982:						
Growing stock (M cubic feet)	908	±45.2	229	±67.2	1,137	±38.4
Sawtimber[1] (M board feet)	3,643	±54.3	--	--	3,643	±54.3
Sawtimber[2] (M board feet)	3,099	±54.7	--	--	3,099	±54.7

[1]International ¼-inch rule.

[2]Scribner rule.

Table 3.--Total land and water area by ownership class in Colorado's northern Front Range, 1983

Ownership class	Area
	- - Acres - -
Land:	
Public:	
National Forest	2,242,851
National Parks[1]	179,135
Other:	
Bureau of Land Management	202,067
Miscellaneous federal	108,730
State	397,906
County and municipal	256,032
Total other public	964,735
Total public	3,386,721
Private	4,684,661
Total land area	8,071,382
Census water	46,912
Total land and water[2]	8,118,294

[1]Not included with miscellaneous Federal, a component of other public, for purpose of clarity.

[2]U.S. Bureau of the Census, land and water area of the United States, 1980.

Table 4.--Total land area on State and privately owned land by major land class and ownership class in Colorado's northern Front Range, 1983

Land class	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - - - - Acres - - - - - - - - - - - -		
Timberland:			
Reserved	15,737	--	15,737
Nonreserved	49,519	986,804	1,036,323
Total	65,256	986,804	1,052,060
Woodland:			
Reserved	1,603	--	1,603
Nonreserved	2,475	60,709	63,184
Total	4,078	60,709	64,787
Total forest land:			
Reserved	17,340	--	17,340
Nonreserved	51,994	1,047,513	1,099,507
Total	69,334	1,047,513	1,116,847
Nonforest land	328,572	3,637,148	3,965,720
Total land area	397,906	4,684,661	5,082,567

Table 5.--Area of forest land on State and privately owned land by forest type, ownership class, and land class in Colorado's northern Front Range, 1983

Forest type	Ownership class and land class						
	State		Nonindustrial private		All owners		
	Reserved	Nonreserved	Reserved	Nonreserved	Reserved	Nonreserved	Total
	Acres						
Douglas-fir	3,813	7,641	--	153,477	3,813	161,118	164,931
Ponderosa pine	5,839	26,939	--	518,972	5,839	545,911	551,750
Lodgepole pine	3,891	5,332	--	113,183	3,891	118,515	122,406
Limber pine	--	417	--	6,854	--	7,271	7,271
Spruce subalpine-fir	--	1,004	--	22,282	--	23,286	23,286
Spruce	--	2,437	--	44,903	--	47,340	47,340
Aspen	1,021	5,749	--	114,761	1,021	120,510	121,531
Cottonwood	1,173	--	--	12,372	1,173	12,372	13,545
Total timberland	15,737	49,519	--	986,804	15,737	1,036,323	1,052,060
Pinyon-juniper	231	697	--	12,445	231	13,142	13,373
Juniper	--	376	--	3,529	--	3,905	3,905
Oak	1,372	1,231	--	41,266	1,372	42,497	43,869
Riparian	--	171	--	3,469	--	3,640	3,640
Total woodland	1,603	2,475	--	60,709	1,603	63,184	64,787
Total all types	17,340	51,994	--	1,047,513	17,340	1,099,507	1,116,847

Table 6.--Cubic feet of net volume in trees on State and privately owned forest land by species and ownership class in Colorado's northern Front Range, 1983

Species	Ownership class		
	State	Nonindustrial private	Total
	Thousand cubic feet		
Douglas-fir	7,668	167,391	175,059
Ponderosa pine	19,880	407,421	427,301
Lodgepole pine	6,902	143,754	150,656
Whitebark pine	397	6,857	7,254
Limber pine	658	12,351	13,009
Subalpine fir	549	11,423	11,972
White fir	85	2,154	2,239
Engelmann spruce	5,350	104,515	109,865
Aspen	2,850	52,662	55,512
Cottonwood	--	10,915	10,915
Total timberland species	44,339	919,443	963,782
Pinyon/juniper	585	12,048	12,633
Woodland hardwoods	385	8,759	9,144
Total woodland species	970	20,807	21,777
Total all species	45,309	940,250	985,559

Table 7.--Cubic feet of net annual growth in trees on State and privately owned forest land by species and ownership class in Colorado's northern Front Range, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - Thousand cubic feet - - - - -		
Douglas-fir	163	3,871	4,034
Ponderosa pine	400	8,202	8,602
Lodgepole pine	240	4,561	4,801
Whitebark pine	6	106	112
Limber pine	17	314	331
Subalpine fir	9	190	199
White fir	6	130	136
Engelmann spruce	84	1,710	1,794
Aspen	88	1,822	1,910
Cottonwood	--	444	444
Total timberland species	1,013	21,350	22,363
Pinyon/juniper	10	143	153
Woodland hardwoods	11	308	319
Total woodland species	21	451	472
Total all species	1,034	21,801	22,835

Table 8.--Cubic feet of annual mortality in trees on State and privately owned forest land by species and ownership class in Colorado's northern Front Range, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - Thousand cubic feet - - - - -		
Douglas-fir	5	145	150
Ponderosa pine	12	307	319
Lodgepole pine	--	112	112
Whitebark pine	--	--	--
Limber pine	--	--	--
Subalpine fir	--	--	--
White fir	--	--	--
Engelmann spruce	17	310	327
Aspen	14	215	229
Cottonwood	--	--	--
Total timberland species	48	1,089	1,137
Pinyon/juniper	--	--	--
Woodland hardwoods	--	--	--
Total woodland species	--	--	--
Total all species	48	1,089	1,137

Table 9.--Area of State and privately owned timberland by forest type, stand-size class, and productivity class in Colorado's northern Front Range, 1983

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - - - - - Acres - - - - - - - - - - - - - - - -				
Douglas-fir:					
Sawtimber	--	11,676	91,558	7,308	110,542
Poletimber	--	--	40,881	--	40,881
Sapling and seedling	--	--	3,892	--	3,892
Nonstocked	--	--	5,803	--	5,803
Total	--	11,676	142,134	7,308	161,118
Ponderosa pine:					
Sawtimber	--	27,854	392,164	3,892	423,910
Poletimber	--	--	55,644	--	55,644
Sapling and seedling	--	--	13,716	--	13,716
Nonstocked	--	--	52,641	--	52,641
Total	--	27,854	514,165	3,892	545,911
Lodgepole pine:					
Sawtimber	--	10,835	22,850	--	33,685
Poletimber	--	--	72,104	12,726	84,830
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	10,835	94,954	12,726	118,515
Limber pine:					
Sawtimber	--	--	7,271	--	7,271
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	7,271	--	7,271
Spruce-subalpine fir:					
Sawtimber	--	--	11,298	--	11,298
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	4,717	--	4,717
Nonstocked	--	--	--	7,271	7,271
Total	--	--	16,015	7,271	23,286

(con.)

Table 9.--(con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - - - Acres - - - - - - - - - - - - - -				
Spruce:					
Sawtimber	--	19,960	21,962	--	41,922
Poletimber	--	--	5,418	--	5,418
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	19,960	27,380	--	47,340
Aspen:					
Sawtimber	--	--	14,580	--	14,580
Poletimber	--	11,922	44,818	--	56,740
Sapling and seedling	--	--	44,603	4,587	49,190
Nonstocked	--	--	--	--	--
Total	--	11,922	104,001	4,587	120,510
Cottonwood:					
Sawtimber	--	6,186	--	--	6,186
Poletimber	--	6,186	--	--	6,186
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	12,372	--	--	12,372
All types:					
Sawtimber	--	76,511	561,683	11,200	649,394
Poletimber	--	18,108	218,865	12,726	249,699
Sapling and seedling	--	--	66,928	4,587	71,515
Nonstocked	--	--	58,444	7,271	65,715
Total	--	94,619	905,920	35,784	1,036,323

Table 10.--Area of State owned timberland by forest type, stand-size class, and productivity class in Colorado's northern Front Range, 1983

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - - - Acres - - - - - - - - - - - - - -				
Douglas-fir:					
Sawtimber	--	396	4,541	502	5,439
Poletimber	--	--	1,602	--	1,602
Sapling and seedling	--	--	132	--	132
Nonstocked	--	--	468	--	468
Total	--	396	6,743	502	7,641
Ponderosa pine:					
Sawtimber	--	1,733	18,445	132	20,310
Poletimber	--	--	2,678	--	2,678
Sapling and seedling	--	--	668	--	668
Nonstocked	--	--	3,283	--	3,283
Total	--	1,733	25,074	132	26,939
Lodgepole pine:					
Sawtimber	--	580	492	--	1,072
Poletimber	--	--	3,467	793	4,260
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	580	3,959	793	5,332
Limber pine:					
Sawtimber	--	--	417	--	417
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	417	--	417
Spruce-subalpine fir:					
Sawtimber	--	--	587	--	587
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	417	417
Total	--	--	587	417	1,004

(con.)

Table 10.--(con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - - - Acres - - - - - - - - - - - - - -				
Spruce:					
Sawtimber	--	1,124	1,023	--	2,147
Poletimber	--	--	290	--	290
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	1,124	1,313	--	2,437
Aspen:					
Sawtimber	--	--	919	--	919
Poletimber	--	643	2,062	--	2,705
Sapling and seedling	--	--	2,030	95	2,125
Nonstocked	--	--	--	--	--
Total	--	643	5,011	95	5,749
Cottonwood:					
Sawtimber	--	--	--	--	--
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	--	--
All types:					
Sawtimber	--	3,833	26,424	634	30,891
Poletimber	--	643	10,099	793	11,535
Sapling and seedling	--	--	2,830	95	2,925
Nonstocked	--	--	3,751	417	4,168
Total	--	4,476	43,104	1,939	49,519

Table 11.--Area of nonindustrial privately owned timberland by forest type, stand-size class, and productivity class in Colorado's northern Front Range, 1983

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - - - Acres - - - - - - - - - - - - - -				
Douglas-fir:					
Sawtimber	--	11,280	87,017	6,806	105,103
Poletimber	--	--	39,279	--	39,279
Sapling and seedling	--	--	3,760	--	3,760
Nonstocked	--	--	5,335	--	5,335
Total	--	11,280	135,391	6,806	153,477
Ponderosa pine:					
Sawtimber	--	26,121	373,719	3,760	403,600
Poletimber	--	--	52,966	--	52,966
Sapling and seedling	--	--	13,048	--	13,048
Nonstocked	--	--	49,358	--	49,358
Total	--	26,121	489,091	3,760	518,972
Lodgepole pine:					
Sawtimber	--	10,255	22,358	--	32,613
Poletimber	--	--	68,637	11,933	80,570
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	10,255	90,995	11,933	113,183
Limber pine:					
Sawtimber	--	--	6,854	--	6,854
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	6,854	--	6,854
Spruce-subalpine fir:					
Sawtimber	--	--	10,711	--	10,711
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	4,717	--	4,717
Nonstocked	--	--	--	6,854	6,854
Total	--	--	15,428	6,854	22,282

(con.)

Table 11.--(con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - - Acres - - - - - - - - - - - - -				
Spruce:					
Sawtimber	--	18,836	20,939	--	39,775
Poletimber	--	--	5,128	--	5,128
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	18,836	26,067	--	44,903
Aspen:					
Sawtimber	--	--	13,661	--	13,661
Poletimber	--	11,279	42,756	--	54,035
Sapling and seedling	--	--	42,573	4,492	47,065
Nonstocked	--	--	--	--	--
Total	--	11,279	98,990	4,492	114,761
Cottonwood:					
Sawtimber	--	6,186	--	--	6,186
Poletimber	--	6,186	--	--	6,186
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	12,372	--	--	12,372
All types:					
Sawtimber	--	72,678	535,259	10,566	618,503
Poletimber	--	17,465	208,766	11,933	238,164
Sapling and seedling	--	--	64,098	4,492	68,590
Nonstocked	--	--	54,693	6,854	61,547
Total	--	90,143	862,816	33,845	986,804

Table 12.--Area of State and privately owned timberland by stand volume and ownership class in Colorado's northern Front Range, 1983

Stand volume per acre[1]	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - - Acres - - - - - - - - - -		
Less than 1,500 board feet	20,081	378,183	398,264
1,500 to 4,999 board feet	22,503	464,551	487,054
5,000 to 9,999 board feet	5,562	117,464	123,026
10,000 board feet or more	1,373	26,606	27,979
All classes	49,519	986,804	1,036,323

[1]International ¼-inch rule.

Table 13.--Area of State and privately owned timberland by forest type and area condition class in Colorado's northern Front Range, 1983

Forest type	Area condition class										
	10	20	30	40	50	60	70	80	90	Nonstocked	All classes
	Acres										
Douglas-fir	--	--	--	3,891	22,432	43,911	31,732	--	53,349	5,803	161,118
Ponderosa pine	--	--	--	--	31,572	166,733	175,894	3,892	115,179	52,641	545,911
Lodgepole pine	--	--	--	32,900	31,547	32,415	9,127	5,418	7,108	--	118,515
Limber pine	--	--	--	--	--	--	--	--	7,271	--	7,271
Spruce-subalpine fir	--	--	--	--	10,597	--	--	--	5,418	7,271	23,286
Spruce	--	--	--	--	--	12,689	12,486	--	22,165	--	47,340
Aspen	--	--	--	--	76,521	38,187	5,802	--	--	--	120,510
Cottonwood	--	--	--	--	--	6,186	--	--	6,186	--	12,372
All types	--	--	--	36,791	172,669	300,121	235,041	9,310	216,676	65,715	1,036,323

Table 14.--Number of growing-stock trees on State and privately owned timberland by species and diameter class in Colorado's northern Front Range, 1983

Species	Diameter class (inches at breast height)															
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand trees															
Douglas-fir	8,924	14,304	10,999	6,355	4,029	2,486	972	463	407	227	68	30	13	--	--	49,277
Ponderosa pine	14,031	14,838	16,591	12,532	9,518	7,608	4,032	2,668	1,002	288	170	60	29	7	20	83,394
Lodgepole pine	4,899	13,305	13,930	9,365	2,738	1,298	374	88	22	--	--	--	--	--	--	46,019
Whitebark pine	1,053	728	277	153	448	152	--	82	--	--	--	--	--	--	--	2,893
Limber pine	1,100	--	1,022	1,361	102	139	45	53	36	--	--	--	--	--	--	3,858
Subalpine fir	1,625	2,167	207	424	478	165	--	60	--	--	--	--	--	--	--	5,126
White fir	--	--	306	162	--	--	--	--	--	--	12	--	--	--	--	480
Engelmann spruce	11,620	4,705	1,304	2,368	2,449	848	707	474	241	102	33	61	--	10	--	24,922
Total softwoods	43,252	50,047	44,636	32,720	19,762	12,696	6,130	3,888	1,708	617	283	151	42	17	20	215,969
Aspen	25,935	22,817	14,927	4,471	1,270	297	59	--	--	--	--	--	--	--	--	69,776
Cottonwood	--	--	892	425	549	66	--	37	28	--	--	--	--	--	16	2,013
Total hardwoods	25,935	22,817	15,819	4,896	1,819	363	59	37	28	--	--	--	--	--	16	71,789
All species	69,187	72,864	60,455	37,616	21,581	13,059	6,189	3,925	1,736	617	283	151	42	17	36	287,758

Table 15.--Number of cull and salvable dead trees on State and privately owned timberland by ownership class, and softwoods and hardwoods in Colorado's northern Front Range, 1983

Ownership class and species group	Cull trees			Salvable dead trees	All dead trees
	Sound	Rotten	Total		
	- - - - - - - - - - Thousand trees - - - - - - - - - -				
State:					
Softwoods	16	20	36	396	432
Hardwoods	--	15	15	202	217
Total	16	35	51	598	649
Nonindustrial private:					
Softwoods	318	560	878	7,050	7,928
Hardwoods	--	480	480	3,730	4,210
Total	318	1,040	1,358	10,780	12,138
Total:					
Softwoods	334	580	914	7,446	8,360
Hardwoods	--	495	495	3,932	4,427
Total	334	1,075	1,409	11,378	12,787

Table 16.--Net volume of growing stock on State and privately owned timberland by ownership class, forest type, and stand-size class in Colorado's northern Front Range, 1983

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
		Thousand cubic feet				
State:						
	Douglas-fir	6,335	1,397	39	--	7,771
	Ponderosa pine	17,248	2,323	238	175	19,984
	Lodgepole pine	2,330	4,157	--	--	6,487
	Limber pine	274	--	--	--	274
	Spruce-subalpine fir	1,388	--	--	90	1,478
	Spruce	4,303	488	--	--	4,791
	Aspen	798	1,985	765	--	3,548
	Cottonwood	--	--	--	--	--
	All types	32,676	10,350	1,042	265	44,333
Nonindustrial private:						
	Douglas-fir	122,135	36,592	1,122	--	159,849
	Ponderosa pine	355,470	47,700	4,743	2,936	410,849
	Lodgepole pine	56,825	84,981	--	--	141,806
	Limber pine	4,504	--	--	--	4,504
	Spruce-subalpine fir	24,722	--	6,158	1,467	32,347
	Spruce	78,785	8,617	--	--	87,402
	Aspen	11,714	41,964	17,840	--	71,518
	Cottonwood	2,696	8,219	--	--	10,915
	All types	656,851	228,073	29,863	4,403	919,190
Total:						
	Douglas-fir	128,470	37,989	1,161	--	167,620
	Ponderosa pine	372,718	50,023	4,981	3,111	430,833
	Lodgepole pine	59,155	89,138	--	--	148,293
	Limber pine	4,778	--	--	--	4,778
	Spruce-subalpine fir	26,110	--	6,158	1,557	33,825
	Spruce	83,088	9,105	--	--	92,193
	Aspen	12,512	43,949	18,605	--	75,066
	Cottonwood	2,696	8,219	--	--	10,915
	All types	689,527	238,423	30,905	4,668	963,523

Table 17.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class, forest type, and stand-size class in Colorado's northern Front Range, 1983

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
		- - - Thousand board feet, International ¼-inch rule - - -				
State:						
	Douglas-fir	22,175	2,744	77	--	24,996
	Ponderosa pine	66,821	4,376	867	724	72,788
	Lodgepole pine	7,459	3,456	--	--	10,915
	Limber pine	920	--	--	--	920
	Spruce-subalpine fir	5,652	--	--	353	6,005
	Spruce	17,170	926	--	--	18,096
	Aspen	2,266	1,745	1,367	--	5,378
	Cottonwood	--	--	--	--	--
	All types	122,463	13,247	2,311	1,077	139,098
Nonindustrial private:						
	Douglas-fir	439,745	72,330	2,185	--	514,260
	Ponderosa pine	1,369,379	89,680	17,252	12,095	1,488,406
	Lodgepole pine	169,144	80,714	--	--	249,858
	Limber pine	15,125	--	--	--	15,125
	Spruce-subalpine fir	100,375	--	13,206	5,817	119,398
	Spruce	310,413	16,358	--	--	326,771
	Aspen	32,684	49,738	31,590	--	114,012
	Cottonwood	12,615	4,268	--	--	16,883
	All types	2,449,480	313,088	64,233	17,912	2,844,713
Total:						
	Douglas-fir	461,920	75,074	2,262	--	539,256
	Ponderosa pine	1,436,200	94,056	18,119	12,819	1,561,194
	Lodgepole pine	176,603	84,170	--	--	260,773
	Limber pine	16,045	--	--	--	16,045
	Spruce-subalpine fir	106,027	--	13,206	6,170	125,403
	Spruce	327,583	17,284	--	--	344,867
	Aspen	34,950	51,483	32,957	--	119,390
	Cottonwood	12,615	4,268	--	--	16,883
	All types	2,571,943	326,335	66,544	18,989	2,983,811

Table 18.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by ownership class, forest type, and stand-size class in Colorado's northern Front Range, 1983

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
		- - - - - - Thousand board feet, Scribner rule - - - - - -				
State:						
	Douglas-fir	18,770	2,327	63	--	21,160
	Ponderosa pine	56,319	3,595	741	591	61,246
	Lodgepole pine	6,334	2,914	--	--	9,248
	Limber pine	776	--	--	--	776
	Spruce-subalpine fir	4,756	--	--	302	5,058
	Spruce	14,370	786	--	--	15,156
	Aspen	1,912	1,470	1,161	--	4,543
	Cottonwood	--	--	--	--	--
	All types	103,237	11,092	1,965	893	117,187
Nonindustrial private:						
	Douglas-fir	372,640	60,773	1,807	--	435,220
	Ponderosa pine	1,155,845	72,741	14,731	9,873	1,253,190
	Lodgepole pine	144,093	68,880	--	--	212,973
	Limber pine	12,751	--	--	--	12,751
	Spruce-subalpine fir	84,460	--	11,754	4,974	101,188
	Spruce	260,235	13,899	--	--	274,134
	Aspen	27,539	41,738	26,854	--	96,131
	Cottonwood	10,973	3,424	--	--	14,397
	All types	2,068,536	261,455	55,146	14,847	2,399,984
Total:						
	Douglas-fir	391,410	63,100	1,870	--	456,380
	Ponderosa pine	1,212,164	76,336	15,472	10,464	1,314,436
	Lodgepole pine	150,427	71,794	--	--	222,221
	Limber pine	13,527	--	--	--	13,527
	Spruce-subalpine fir	89,216	--	11,754	5,276	106,246
	Spruce	274,605	14,685	--	--	289,290
	Aspen	29,451	43,208	28,015	--	100,674
	Cottonwood	10,973	3,424	--	--	14,397
	All types	2,171,773	272,547	57,111	15,740	2,517,171

Table 19.--Net volume of growing stock on State and privately owned timberland by ownership class and species in Colorado's northern Front Range, 1983

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Douglas-fir	7,666	167,329	174,995
Ponderosa pine	19,876	407,229	427,105
Lodgepole pine	6,902	143,754	150,656
Whitebark pine	397	6,857	7,254
Limber pine	658	12,351	13,009
Subalpine fir	549	11,423	11,972
White fir	85	2,154	2,239
Engelmann Spruce	5,350	104,516	109,866
Total softwoods	41,483	855,613	897,096
Aspen	2,850	52,662	55,512
Cottonwood	--	10,915	10,915
Total hardwoods	2,850	63,577	66,427
All species	44,333	919,190	963,523

Table 20.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class and species in Colorado's northern Front Range, 1983

Species	Ownership class		Total
	State	Nonindustrial private	
	- - Thousand board feet, International ¼-inch rule - -		
Douglas-fir	25,466	559,772	585,238
Ponderosa pine	73,892	1,494,410	1,568,302
Lodgepole pine	12,154	257,220	269,374
Whitebark pine	1,176	20,111	21,287
Limber pine	1,085	20,755	21,840
Subalpine fir	1,747	34,495	36,242
White fir	106	3,035	3,141
Engelmann Spruce	22,405	418,666	441,071
Total softwoods	138,031	2,808,464	2,946,495
Aspen	1,067	19,366	20,433
Cottonwood	--	16,883	16,883
Total hardwoods	1,067	36,249	37,316
All species	139,098	2,844,713	2,983,811

Table 21.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by ownership class and species in Colorado's northern Front Range, 1983

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - Thousand board feet, Scribner rule - - - - -		
Douglas-fir	21,652	476,741	498,393
Ponderosa pine	61,996	1,253,984	1,315,980
Lodgepole pine	10,363	219,759	230,122
Whitebark pine	960	16,431	17,391
Limber pine	904	17,272	18,176
Subalpine fir	1,485	29,482	30,967
White fir	92	2,624	2,716
Engelmann Spruce	18,817	352,594	371,411
Total softwoods	116,269	2,368,887	2,485,156
Aspen	918	16,700	17,618
Cottonwood	--	14,397	14,397
Total hardwoods	918	31,097	32,015
All species	117,187	2,399,984	2,517,171

Table 22.--Net volume of growing stock on State and privately owned timberland by species and diameter class in Colorado's northern Front Range, 1983

Species	Diameter class (inches at breast height)													All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand cubic feet													
Douglas-fir	17,516	26,367	34,277	31,258	19,060	12,326	15,930	10,419	3,972	2,699	1,171	--	--	174,995
Ponderosa pine	26,161	49,034	64,877	89,795	73,133	63,550	31,500	11,762	8,059	3,803	2,413	657	2,361	427,105
Lodgepole pine	31,859	51,570	32,090	22,006	8,793	3,074	1,264	--	--	--	--	--	--	150,656
Whitebark pine	455	633	3,155	1,331	--	1,680	--	--	--	--	--	--	--	7,254
Limber pine	1,916	5,861	540	1,404	696	1,450	1,142	--	--	--	--	--	--	13,009
Subalpine fir	251	2,822	4,237	3,171	--	1,491	--	--	--	--	--	--	--	11,972
White fir	387	1,123	--	--	--	--	--	--	729	--	--	--	--	2,239
Engelmann spruce	1,764	11,225	24,349	13,718	17,384	17,040	10,909	5,628	2,488	4,269	--	1,092	--	109,866
Total softwoods	80,309	148,635	163,525	162,683	119,066	100,611	60,745	27,809	15,248	10,771	3,584	1,749	2,361	897,096
Aspen	22,876	17,007	11,098	3,691	840	--	--	--	--	--	--	--	--	55,512
Cottonwood	896	1,996	4,488	839	--	656	588	--	--	--	--	--	1,452	10,915
Total hardwoods	23,772	19,003	15,586	4,530	840	656	588	--	--	--	--	--	1,452	66,427
All species	104,081	167,638	179,111	167,213	119,906	101,267	61,333	27,809	15,248	10,771	3,584	1,749	3,813	963,523

Table 23.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by species and diameter class in Colorado's northern Front Range, 1983

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	113,873	133,965	91,953	62,378	83,891	55,511	21,502	15,465	6,700	--	--	585,238
Ponderosa pine	209,471	375,808	348,121	317,779	162,869	61,960	42,638	20,358	12,994	3,541	12,763	1,568,302
Lodgepole pine	110,709	94,442	41,780	15,851	6,592	--	--	--	--	--	--	269,374
Whitebark pine	9,825	4,119	--	7,343	--	--	--	--	--	--	--	21,287
Limber pine	1,622	4,747	2,802	6,977	5,692	--	--	--	--	--	--	21,840
Subalpine fir	14,238	14,944	--	7,060	--	--	--	--	--	--	--	36,242
White fir	--	--	--	--	--	--	3,141	--	--	--	--	3,141
Engelmann spruce	84,419	62,367	84,372	84,965	54,717	28,481	13,106	22,474	--	6,170	--	441,071
Total softwoods	544,157	690,392	569,028	502,353	313,761	145,952	80,387	58,297	19,694	9,711	12,763	2,946,495
Aspen	XXXXX	16,559	3,874	--	--	--	--	--	--	--	--	20,433
Cottonwood	XXXXX	4,268	--	3,217	2,790	--	--	--	--	--	6,608	16,883
Total hardwoods	XXXXX	20,827	3,874	3,217	2,790	--	--	--	--	--	6,608	37,316
All species	544,157	711,219	572,902	505,570	316,551	145,952	80,387	58,297	19,694	9,711	19,371	2,983,811

Table 24.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by species and diameter class in Colorado's northern Front Range, 1983

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Douglas-fir	101,167	116,595	77,153	51,354	68,331	45,802	18,266	13,762	5,963	--	--	498,393
Ponderosa pine	154,595	309,863	297,759	275,316	142,352	54,476	37,589	18,014	11,525	3,144	11,347	1,315,980
Lodgepole pine	95,400	80,472	35,265	13,246	5,739	--	--	--	--	--	--	230,122
Whitebark pine	7,538	3,638	--	6,215	--	--	--	--	--	--	--	17,391
Limber pine	973	4,162	2,394	5,870	4,777	--	--	--	--	--	--	18,176
Subalpine fir	12,605	12,544	--	5,818	--	--	--	--	--	--	--	30,967
White fir	--	--	--	--	--	--	2,716	--	--	--	--	2,716
Engelmann spruce	74,324	53,096	69,737	69,053	44,546	23,789	11,615	19,760	--	5,491	--	371,411
Total softwoods	446,602	580,370	482,308	426,872	265,745	124,067	70,186	51,536	17,488	8,635	11,347	2,485,156
Aspen	XXXXX	14,290	3,328	--	--	--	--	--	--	--	--	17,618
Cottonwood	XXXXX	3,424	--	2,708	2,384	--	--	--	--	--	5,881	14,397
Total hardwoods	XXXXX	17,714	3,328	2,708	2,384	--	--	--	--	--	5,881	32,015
All species	446,602	598,084	485,636	429,580	268,129	124,067	70,186	51,536	17,488	8,635	17,228	2,517,171

Table 25.--Net volume of timber on State and privately owned timberland by class of timber, and softwoods and hardwoods in Colorado's northern Front Range, 1983

Class of timber	Softwoods	Hardwoods	All classes
	Thousand cubic feet		
Sawtimber trees:			
Sawlog portion	574,418	6,148	580,566
Upper-stem portion	93,733	1,918	95,651
Total	668,151	8,066	676,217
Poletimber trees	228,945	58,361	287,306
All growing stock trees	897,096	66,427	963,523
Sound cull trees	392	--	392
Rotten cull trees	1,048	759	1,807
Salvable dead trees	31,750	4,509	36,259
All timber	930,286	71,695	1,001,981

Table 26.--Net volume of growing stock on State and privately owned timberland by forest type and species in Colorado's northern Front Range, 1983

Forest type	Species							
	Douglas-fir	Ponderosa pine	Lodgepole pine	Whitebark pine	Limber pine	Subalpine fir	White fir	Engelmann spruce
	Thousand cubic feet							
Douglas-fir	115,130	34,311	4,058	--	4,604	--	1,852	4,512
Ponderosa pine	39,043	376,851	7,717	--	1,080	--	--	1,732
Lodgepole pine	6,722	2,834	131,906	--	468	--	--	5,897
Limber pine	1,514	--	--	455	2,809	--	--	--
Spruce-subalpine fir	--	--	--	2,960	1,786	11,263	--	17,816
Spruce	3,400	--	2,865	3,174	--	709	--	78,351
Aspen	9,186	13,109	4,110	665	2,262	--	387	1,558
Cottonwood	--	--	--	--	--	--	--	--
All types	174,995	427,105	150,656	7,254	13,009	11,972	2,239	109,866

Table 26.(con.)

Forest type	Species				
	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	Thousand cubic feet				
Douglas-fir	164,467	3,153	--	3,153	167,620
Ponderosa pine	426,423	4,410	--	4,410	430,833
Lodgepole pine	147,827	466	--	466	148,293
Limber pine	4,778	--	--	--	4,778
Spruce-subalpine fir	33,825	--	--	--	33,825
Spruce	88,499	3,694	--	3,694	92,193
Aspen	31,277	43,789	--	43,789	75,066
Cottonwood	--	--	10,915	10,915	10,915
All types	897,096	55,512	10,915	66,427	963,523

Table 27.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by forest type and species in Colorado's northern Front Range, 1983

Forest type	Species							
	Douglas-fir	Ponderosa pine	Lodgepole pine	Whitebark pine	Limber pine	Subalpine fir	White fir	Engelmann spruce
	Thousand board feet, International ¼-inch rule							
Douglas-fir	379,711	117,701	12,355	--	5,711	--	3,141	15,880
Ponderosa pine	134,177	1,398,276	18,927	--	--	--	--	5,273
Lodgepole pine	17,984	5,071	216,099	--	1,267	--	--	20,352
Limber pine	7,336	--	--	--	8,709	--	--	--
Spruce-subalpine fir	--	--	--	8,604	6,153	34,176	--	76,470
Spruce	6,161	--	6,613	10,454	--	2,066	--	319,573
Aspen	39,869	47,254	15,380	2,229	--	--	--	3,523
Cottonwood	--	--	--	--	--	--	--	--
All types	585,238	1,568,302	269,374	21,287	21,840	36,242	3,141	441,071

Table 27.(con.)

Forest type	Species				
	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	Thousand board feet, International ¼-inch rule				
Douglas-fir	534,499	4,757	--	4,757	539,256
Ponderosa pine	1,556,653	4,541	--	4,541	1,561,194
Lodgepole pine	260,773	--	--	--	260,773
Limber pine	16,045	--	--	--	16,045
Spruce-subalpine fir	125,403	--	--	--	125,403
Spruce	344,867	--	--	--	344,867
Aspen	108,255	11,135	--	11,135	119,390
Cottonwood	--	--	16,883	16,883	16,883
All types	2,946,495	20,433	16,883	37,316	2,983,811

Table 28.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by forest type and species in Colorado's northern Front Range, 1983

Forest type	Species							
	Douglas-fir	Ponderosa pine	Lodgepole pine	Whitebark pine	Limber pine	Subalpine fir	White fir	Engelmann spruce
	- Thousand board feet, Scribner rule -							
Douglas-fir	323,346	97,357	10,598	--	4,801	--	2,716	13,469
Ponderosa pine	114,459	1,175,340	16,388	--	--	--	--	4,344
Lodgepole pine	15,526	3,832	184,419	--	1,068	--	--	17,376
Limber pine	6,121	--	--	--	7,406	--	--	--
Spruce-subalpine fir	--	--	--	7,433	4,901	29,129	--	64,783
Spruce	5,483	--	5,600	7,999	--	1,838	--	268,370
Aspen	33,458	39,451	13,117	1,959	--	--	--	3,069
Cottonwood	--	--	--	--	--	--	--	--
All types	498,393	1,315,980	230,122	17,391	18,176	30,967	2,716	371,411

Table 28.(con.)

Forest type	Species				
	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	- - - - - - - - Thousand board feet, Scribner rule - - - - - - - - -				
Douglas-fir	452,287	4,093	--	4,093	456,380
Ponderosa pine	1,310,531	3,905	--	3,905	1,314,436
Lodgepole pine	222,221	--	--	--	222,221
Limber pine	13,527	--	--	--	13,527
Spruce-subalpine fir	106,246	--	--	--	106,246
Spruce	289,290	--	--	--	289,290
Aspen	91,054	9,620	--	9,620	100,674
Cottonwood	--	--	14,397	14,397	14,397
All types	2,485,156	17,618	14,397	32,015	2,517,171

Table 29.--Net annual growth of growing stock on State and privately owned timberland by ownership class and species in Colorado's northern Front Range, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Douglas-fir	163	3,870	4,033
Ponderosa pine	400	8,200	8,600
Lodgepole pine	241	4,560	4,801
Whitebark pine	6	106	112
Limber pine	17	314	331
Subapline fir	9	190	199
White fir	6	130	136
Engelmann spruce	84	1,710	1,794
Total softwoods	926	19,080	20,006
Aspen	88	1,822	1,910
Cottonwood	--	444	444
Total hardwoods	88	2,266	2,354
All species	1,014	21,346	22,360

Table 30.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class and species in Colorado's northern Front Range, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
	- - Thousand board feet, International ¼-inch rule - - -		
Douglas-fir	503	13,710	14,213
Ponderosa pine	2,553	49,967	52,520
Lodgepole pine	193	4,709	4,902
Whitebark pine	19	341	360
Limber pine	25	457	482
Subapline fir	25	2,091	2,116
White fir	1	22	23
Engelmann spruce	595	11,571	12,166
Total softwoods	3,914	82,868	86,782
Aspen	258	4,829	5,087
Cottonwood	--	272	272
Total hardwoods	258	5,101	5,359
All species	4,172	87,969	92,141

Table 31.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland by ownership class and species in Colorado's northern Front Range, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - Thousand board feet, Scribner rule - - - - - -		
Douglas-fir	423	11,657	12,080
Ponderosa pine	2,011	40,174	42,185
Lodgepole pine	167	4,094	4,261
Whitebark pine	18	314	332
Limber pine	20	367	387
Subapline fir	21	1,828	1,849
White fir	1	23	24
Engelmann spruce	508	9,917	10,425
Total softwoods	3,169	68,374	71,543
Aspen	222	4,149	4,371
Cottonwood	--	248	248
Total hardwoods	222	4,397	4,619
All species	3,391	72,771	76,162

Table 32.--Net annual growth of growing stock on State and privately owned timberland by species and diameter clas in Colorado's northern Front Range, 1982

Species	Diameter class (inches at breast height)													All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand cubic feet													
Douglas-fir	1,153	675	868	690	312	121	178	-39	43	26	6	--	--	4,033
Ponderosa pine	1,638	1,195	1,545	1,603	1,170	789	430	100	63	48	13	1	5	8,600
Lodgepole pine	2,882	1,160	357	292	81	27	2	--	--	--	--	--	--	4,801
Whitebark pine	12	20	62	12	--	6	--	--	--	--	--	--	--	112
Limber pine	115	118	19	34	24	9	12	--	--	--	--	--	--	331
Subalpine fir	12	64	76	39	--	8	--	--	--	--	--	--	--	199
White fir	52	78	--	--	--	--	--	--	6	--	--	--	--	136
Engelmann spruce	247	302	541	235	280	223	-198	42	12	105	--	5	--	1,794
Total softwoods	6,111	3,612	3,468	2,905	1,867	1,183	424	103	124	179	19	6	5	20,006
Aspen	1,422	303	116	60	9	--	--	--	--	--	--	--	--	1,910
Cottonwood	202	42	143	20	--	9	8	--	--	--	--	--	20	444
Total hardwoods	1,624	345	259	80	9	9	8	--	--	--	--	--	20	2,354
All species	7,735	3,957	3,727	2,985	1,876	1,192	432	103	124	179	19	6	25	22,360

Table 33.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland by species and diameter class in Colorado's northern Front Range, 1982

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand board feet, International ¼-inch rule											
Douglas-fir	6,415	4,024	1,796	689	1,017	-175	248	166	33	--	--	14,213
Ponderosa pine	27,946	9,537	6,798	4,532	2,432	558	347	264	75	6	25	52,520
Lodgepole pine	2,626	1,624	493	145	14	--	--	--	--	--	--	4,902
Whitebark pine	276	51	--	33	--	--	--	--	--	--	--	360
Limber pine	57	183	121	52	69	--	--	--	--	--	--	482
Subalpine fir	1,861	213	--	42	--	--	--	--	--	--	--	2,116
White fir	--	--	--	--	--	--	23	--	--	--	--	23
Engelmann spruce	8,312	1,304	1,509	1,162	-1,039	211	73	600	--	34	--	12,166
Total softwoods	47,493	16,936	10,717	6,655	2,493	594	691	1,030	108	40	25	86,782
Aspen	XXXXX	5,037	50	--	--	--	--	--	--	--	--	5,087
Cottonwood	XXXXX	102	--	41	33	--	--	--	--	--	96	272
Total hardwoods	XXXXX	5,139	50	41	33	--	--	--	--	--	96	5,359
All species	47,493	22,075	10,767	6,696	2,526	594	691	1,030	108	40	121	92,141

Table 34.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland by species and diameter class in Colorado's northern Front Range, 1982

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand board feet, Scribner rule											
Douglas-fir	5,688	3,312	1,417	541	810	-115	243	155	29	--	--	12,080
Ponderosa pine	20,035	8,690	6,086	4,058	2,177	499	310	236	66	5	23	42,185
Lodgepole pine	2,359	1,347	409	133	13	--	--	--	--	--	--	4,261
Whitebark pine	251	54	--	27	--	--	--	--	--	--	--	332
Limber pine	34	152	100	43	58	--	--	--	--	--	--	387
Subalpine fir	1,650	166	--	33	--	--	--	--	--	--	--	1,849
White fir	--	--	--	--	--	--	24	--	--	--	--	24
Engelmann spruce	7,417	1,029	1,185	913	-957	185	72	551	--	30	--	10,425
Total softwoods	37,434	14,750	9,197	5,748	2,101	569	649	942	95	35	23	71,543
Aspen	XXXXX	4,329	42	--	--	--	--	--	--	--	--	4,371
Cottonwood	XXXXX	94	--	38	30	--	--	--	--	--	86	248
Total hardwoods	XXXXX	4,423	42	38	30	--	--	--	--	--	86	4,619
All species	37,434	19,173	9,239	5,786	2,131	569	649	942	95	35	109	76,162

Table 35.--Annual mortality of growing stock on State and privately owned timberland by ownership class and species in Colorado's northern Front Range, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - - Thousand cubic feet - - - - - - - - - -		
Douglas-fir	5	145	150
Ponderosa pine	12	307	319
Lodgepole pine	--	112	112
Engelmann spruce	17	310	327
Total softwoods	34	874	908
Aspen	14	215	229
Total hardwoods	14	215	229
All species	48	1,089	1,137

Table 36.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class and species in Colorado's northern Front Range, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - Thousand board feet, International ¼-inch rule - - - -		
Douglas-fir	27	779	806
Ponderosa pine	45	745	790
Lodgepole pine	--	336	336
Engelmann spruce	92	1,619	1,711
Total softwoods	164	3,479	3,643
All species	164	3,479	3,643

Table 37.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by ownership class and species in Colorado's northern Front Range, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - Thousand board feet, Scribner rule - - - - - - -		
Douglas-fir	22	625	647
Ponderosa pine	38	626	664
Lodgepole pine	--	294	294
Engelmann spruce	80	1,414	1,494
Total softwoods	140	2,959	3,099
All species	140	2,959	3,099

Table 38.--Annual mortality of growing stock on State and privately owned timberland by species and diameter class in Colorado's northern Front Range, 1982

Species	Diameter class (inches at breast height)													All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand cubic feet													
Douglas-fir	--	--	--	--	--	--	--	150	--	--	--	--	--	150
Ponderosa pine	44	97	--	178	--	--	--	--	--	--	--	--	--	319
Lodgepole pine	--	--	112	--	--	--	--	--	--	--	--	--	--	112
Engelmann spruce	--	--	--	--	--	--	327	--	--	--	--	--	--	327
Total softwoods	44	97	112	178	--	--	327	150	--	--	--	--	--	908
Aspen	([1])	98	131	--	--	--	--	--	--	--	--	--	--	229
Total hardwoods	([1])	98	131	--	--	--	--	--	--	--	--	--	--	229
All species	44	195	243	178	--	--	327	150	--	--	--	--	--	1,137

[1]Less than 500 cubic feet.

Table 39.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by species and diameter class in Colorado's northern Front Range, 1982

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand board feet, International ¼-inch rule											
Douglas-fir	--	--	--	--	--	806	--	--	--	--	--	806
Ponderosa pine	--	790	--	--	--	--	--	--	--	--	--	790
Lodgepole pine	336	--	--	--	--	--	--	--	--	--	--	336
Engelmann spruce	--	--	--	--	1,711	--	--	--	--	--	--	1,711
Total softwoods	336	790	--	--	1,711	806	--	--	--	--	--	3,643
All species	336	790	--	--	1,711	806	--	--	--	--	--	3,643

Table 40.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by species and diameter class in Colorado's northern Front Range, 1982

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	Thousand board feet, Scribner rule											
Douglas-fir	--	--	--	--	--	647	--	--	--	--	--	647
Ponderosa pine	--	664	--	--	--	--	--	--	--	--	--	664
Lodgepole pine	294	--	--	--	--	--	--	--	--	--	--	294
Engelmann spruce	--	--	--	--	1,494	--	--	--	--	--	--	1,494
Total softwoods	294	664	--	--	1,494	647	--	--	--	--	--	3,099
All species	294	664	--	--	1,494	647	--	--	--	--	--	3,099

Table 41.--Annual mortality of growing stock on State and privately owned timberland by cause of death and species in Colorado's northern Front Range, 1982

Species	Cause of Death								Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	
	Thousand cubic feet								
Douglas-fir	--	--	--	--	150	--	--	--	150
Ponderosa pine	97	--	--	--	178	--	--	44	319
Lodgepole pine	--	112	--	--	--	--	--	--	112
Engelmann spruce	--	--	--	--	--	--	--	327	327
Total softwoods	97	112	--	--	328	--	--	371	908
Aspen	--	98	--	--	--	--	--	131	229
Total hardwoods	--	98	--	--	--	--	--	131	229
All species	97	210	--	--	328	--	--	502	1,137

Table 42.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by cause of death and species in Colorado's northern Front Range, 1982

Species	Cause of Death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand board feet, International ¼-inch rule								
Douglas-fir	--	--	--	--	806	--	--	--	806
Ponderosa pine	--	--	--	--	790	--	--	--	790
Lodgepole pine	--	336	--	--	--	--	--	--	336
Engelmann spruce	--	--	--	--	--	--	--	1,711	1,711
Total softwoods	--	336	--	--	1,596	--	--	1,711	3,643
All species	--	336	--	--	1,596	--	--	1,711	3,643

Table 43.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by cause of death and species in Colorado's northern Front Range, 1982

Species	Cause of Death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand board feet, Scribner rule								
Douglas-fir	--	--	--	--	647	--	--	--	647
Ponderosa pine	--	--	--	--	664	--	--	--	664
Lodgepole pine	--	294	--	--	--	--	--	--	294
Engelmann spruce	--	--	--	--	--	--	--	1,494	1,494
Total softwoods	--	294	--	--	1,311	--	--	1,494	3,099
All species	--	294	--	--	1,311	--	--	1,494	3,099

Table 44.--Area of State and privately owned woodland by ownership class and forest type in Colorado's northern Front Range, 1983

Forest type	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - - - - Acres - - - - - - - - - - - -		
Pinyon-juniper	697	12,445	13,142
Juniper	376	3,529	3,905
Total woodland softwoods	1,073	15,974	17,047
Oak	1,231	41,266	42,497
Riparian	171	3,469	3,640
Total woodland hardwoods	1,402	44,735	46,137
All types	2,475	60,709	63,184

Table 45.--Net volume of State and privately owned woodland by ownership class and species in Colorado's northern Front Range, 1983

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Douglas-fir	1	62	63
Ponderosa pine	4	192	196
Pinyon/juniper	403	7,740	8,143
Woodland hardwoods	304	7,523	7,827
All species	712	15,517	16,229

Table 46.--Net annual growth of State and privately owned woodland by ownership class and species in Colorado's northern Front Range, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Douglas-fir	([1])	([1])	([1])
Ponderosa pine	([1])	3	3
Pinyon/juniper	9	107	116
Woodland hardwoods	7	252	259
All species	16	362	378

[1]Less than 500 cubic feet.

Table 47.--Area of State and privately owned timberland by county and ownership class in Colorado's northern Front Range, 1983

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - - - - - - - Acres - - - - - - - - - - - - - - -		
Boulder	681	88,728	89,409
Clear Creek	4,336	38,810	43,146
Douglas	434	54,024	54,458
Elbert	2,611	46,493	49,104
El Paso	3,771	80,558	84,329
Gilpin	458	31,454	31,912
Jefferson	1,942	143,930	145,872
Lake	102	24,892	24,994
Larimer	17,228	217,019	234,247
Park	9,011	153,616	162,627
Teller	8,945	107,280	116,225
Total	49,519	986,804	1,036,323

Table 48.--Net volume of growing stock on State and privately owned timberland by county and ownership class in Colorado's northern Front Range, 1983

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - - Thousand cubic feet - - - - - - - - - -		
Boulder	799	98,202	99,001
Clear Creek	5,042	39,163	44,205
Douglas	440	42,883	43,323
Elbert	1,968	34,283	36,251
El Paso	2,197	67,554	69,751
Gilpin	320	31,820	32,140
Jefferson	1,782	134,296	136,078
Lake	134	33,766	33,900
Larimer	15,904	208,355	224,259
Park	7,810	135,060	142,870
Teller	7,937	93,808	101,745
Total	44,333	919,190	963,523

Table 49.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by county and ownership class in Colorado's northern Front Range, 1983

County	Ownership class		Total
	State	Nonindustrial private	
	- - Thousand board feet, International ¼-inch rule - -		
Boulder	2,308	296,809	299,117
Clear Creek	15,539	112,409	127,948
Douglas	1,524	141,622	143,146
Elbert	6,802	117,249	124,051
El Paso	7,009	223,561	230,570
Gilpin	823	92,002	92,825
Jefferson	6,591	462,297	468,888
Lake	321	80,985	81,306
Larimer	47,800	623,992	671,792
Park	21,622	370,894	392,516
Teller	28,759	322,893	351,652
Total	139,098	2,844,713	2,983,811

Table 50.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by county and ownership class in Colorado's northern Front Range, 1983

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - Thousand board feet, Scribner rule - - - - - -		
Boulder	1,940	249,465	251,405
Clear Creek	13,055	94,538	107,593
Douglas	1,306	120,020	121,326
Elbert	5,755	99,123	104,878
El Paso	5,888	189,675	195,563
Gilpin	691	77,352	78,043
Jefferson	5,601	392,561	398,162
Lake	274	69,161	69,435
Larimer	40,145	523,999	564,144
Park	18,068	310,155	328,223
Teller	24,464	273,935	298,399
Total	117,187	2,399,984	2,517,171

Table 51.--Net annual growth of growing stock on State and privately owned timberland by county and ownership class in Colorado's northern Front Range, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Boulder	21	2,327	2,348
Clear Creek	114	1,044	1,158
Douglas	9	1,004	1,013
Elbert	41	754	795
El Paso	51	1,553	1,604
Gilpin	11	838	849
Jefferson	37	2,996	3,033
Lake	3	744	747
Larimer	402	5,176	5,578
Park	163	2,868	3,031
Teller	162	2,042	2,204
Total	1,014	21,346	22,360

Table 52.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland by county and ownership class in Colorado's northern Front Range, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - Thousand board feet, International ¼-inch rule - -		
Boulder	45	6,801	6,846
Clear Creek	320	2,809	3,129
Douglas	51	4,964	5,015
Elbert	252	4,466	4,718
El Paso	360	8,207	8,567
Gilpin	29	2,222	2,251
Jefferson	215	15,864	16,079
Lake	13	3,297	3,310
Larimer	1,199	15,757	16,956
Park	687	12,106	12,793
Teller	1,001	11,476	12,477
Total	4,172	87,969	92,141

Table 53.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland by county and ownership class in Colorado's northern Front Range, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - Thousand board feet, Scribner rule - - - - - -		
Boulder	38	5,628	5,666
Clear Creek	263	2,318	2,581
Douglas	39	4,120	4,159
Elbert	201	3,612	3,813
El Paso	287	6,756	7,043
Gilpin	23	1,824	1,847
Jefferson	176	13,205	13,381
Lake	12	2,893	2,905
Larimer	966	12,810	13,776
Park	564	10,015	10,579
Teller	822	9,590	10,412
Total	3,391	72,771	76,162

Table 54.--Annual mortality of growing stock on State and privately owned timberland by county and ownership class in Colorado's northern Front Range, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Boulder	1	147	148
Clear Creek	7	54	61
Douglas	--	29	29
Elbert	1	21	22
El Paso	1	51	52
Gilpin	([1])	43	43
Jefferson	1	133	134
Lake	([1])	4	4
Larimer	18	251	269
Park	16	285	301
Teller	3	71	74
Total	48	1,089	1,137

[1]Less than 500 cubic feet.

Table 55.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by county and ownership class in Colorado's northern Front Range, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - Thousand board feet, International ¼-inch rule - -		
Boulder	6	544	550
Clear Creek	29	193	222
Douglas	--	80	80
Elbert	6	95	101
El Paso	2	175	177
Gilpin	--	155	155
Jefferson	5	433	438
Lake	--	8	8
Larimer	57	784	841
Park	45	774	819
Teller	14	238	252
Total	164	3,479	3,643

Table 56.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by county and ownership class in Colorado's northern Front Range, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - Thousand board feet, Scribner rule - - - - - -		
Boulder	5	475	480
Clear Creek	26	168	194
Douglas	--	65	65
Elbert	5	76	81
El Paso	1	145	146
Gilpin	--	135	135
Jefferson	4	357	361
Lake	--	8	8
Larimer	50	685	735
Park	38	651	689
Teller	11	194	205
Total	140	2,959	3,099

Table 57.--Area of State and privately owned woodland by county and ownership class in Colorado's northern Front Range, 1983

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - - - - - - Acres - - - - - - - - - - - - - -		
Boulder	2	1,501	1,503
Clear Creek	26	757	783
Douglas	351	25,488	25,839
Elbert	112	2,154	2,266
El Paso	404	11,227	11,631
Gilpin	(1)	1,921	1,921
Jefferson	1	4,139	4,140
Lake	1	975	976
Larimer	872	5,352	6,224
Park	175	3,754	3,929
Teller	531	3,441	3,972
Total	2,475	60,709	63,184

[1]Less than .05 acres.

Table 58.--Net volume of State and privately owned woodland by county and ownership class in Colorado's northern Front Range, 1983

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - - Thousand cubic feet - - - - - - - - - -		
Boulder	(1)	777	777
Clear Creek	(1)	114	114
Douglas	66	5,949	6,015
Elbert	2	247	249
El Paso	37	3,333	3,370
Gilpin	(1)	350	350
Jefferson	(1)	772	772
Lake	(1)	176	176
Larimer	450	2,086	2,536
Park	47	1,021	1,068
Teller	110	692	802
Total	712	15,517	16,229

[1]Less than 500 cubic feet.

Table 59.--Net annual growth of State and privately owned woodland by county and ownership class in Colorado's northern Front Range, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - - Thousand cubic feet - - - - - - - - - -		
Boulder	(1)	6	6
Clear Creek	(1)	4	4
Douglas	2	162	164
Elbert	(1)	10	10
El Paso	2	69	71
Gilpin	(1)	12	12
Jefferson	(1)	25	25
Lake	(1)	6	6
Larimer	7	34	41
Park	2	22	24
Teller	3	12	15
Total	16	362	378

[1]Less than 500 cubic feet.

Conner, Roger C.; Waters, Shirley H. 1987. Colorado's northern Front Range: forest statistics for State and private land, 1983. Resour. Bull. INT-41. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 46 p.

Presents highlights of the forest resources of the northern Front Range of Colorado. Provides statistical tables for timberland and woodland forest types including area by land classes, ownership, growing-stock volumes, net annual growth, and mortality.

KEYWORDS: timberland, woodland, growing-stock volume, net annual growth, round-wood harvest, fuelwood harvest

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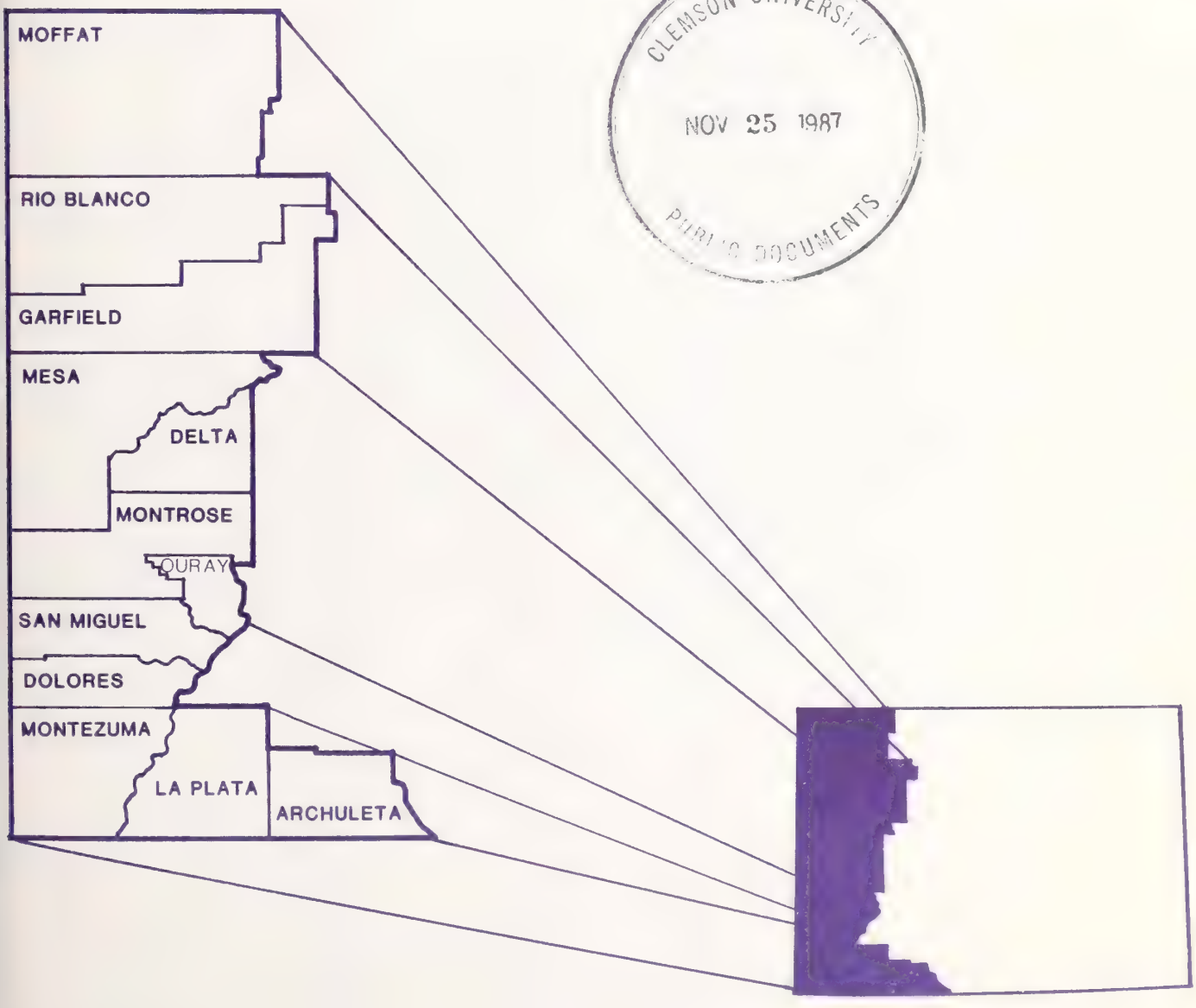

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This report is the result of the combined efforts of numerous people on the Forest Survey staff. In addition to the photo interpretation and field crews, several individuals played key roles in the reduction of basic data into information describing the extent, nature, and condition of the forest resources in Colorado: Dennis Collins supervised the data collection; Sharon Woudenberg and Shirley Waters compiled the data and made summaries; and Susan Brown transformed the data summaries into tables of information. Also, acknowledgment is given to the Colorado State Forest Service for its cooperation and assistance in collecting the inventory data. And we extend a special note of gratitude to the private land owners who allowed the field crews access to the sample locations on their properties.

RESEARCH SUMMARY

Presents land area, timberland area, woodland area, timber inventory, and growth and mortality data for 12 counties in western Colorado. Information and statistical tables are based on Forest Survey data collected from 1981 through 1984 and cover State and private forest resources.

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Western Colorado: Forest Statistics for State and Private Land, 1983

Frank E. Angele
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INTRODUCTION

This resource bulletin reports the findings of the Forest Survey inventory of a sample area defined as State and private lands in Archuleta, Delta, Dolores, Garfield, La Plata, Mesa, Moffat, Montezuma, Montrose, Ouray, Rio Blanco, and San Miguel Counties of western Colorado (fig. 1). The two-phase survey began with prefield work in June 1981. The field phase involved, in whole or in part, successive summers from 1981 to 1984 with the bulk of the data collected in 1982.

The data in this report pertain only to the State and private forest resources of the counties listed above. Data for lands administered by various public agencies such as National Forest Systems and Bureau of Land Management will be included in a subsequent, comprehensive statewide report that will include all lands and all owners.

The primary objective of Forest Survey—a continuing, nationwide undertaking of the Forest Service, U.S. Department of Agriculture—is to provide an assessment of the renewable resources for forest and rangelands of the Nation. Fundamental to the accomplishment of the objective are the periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

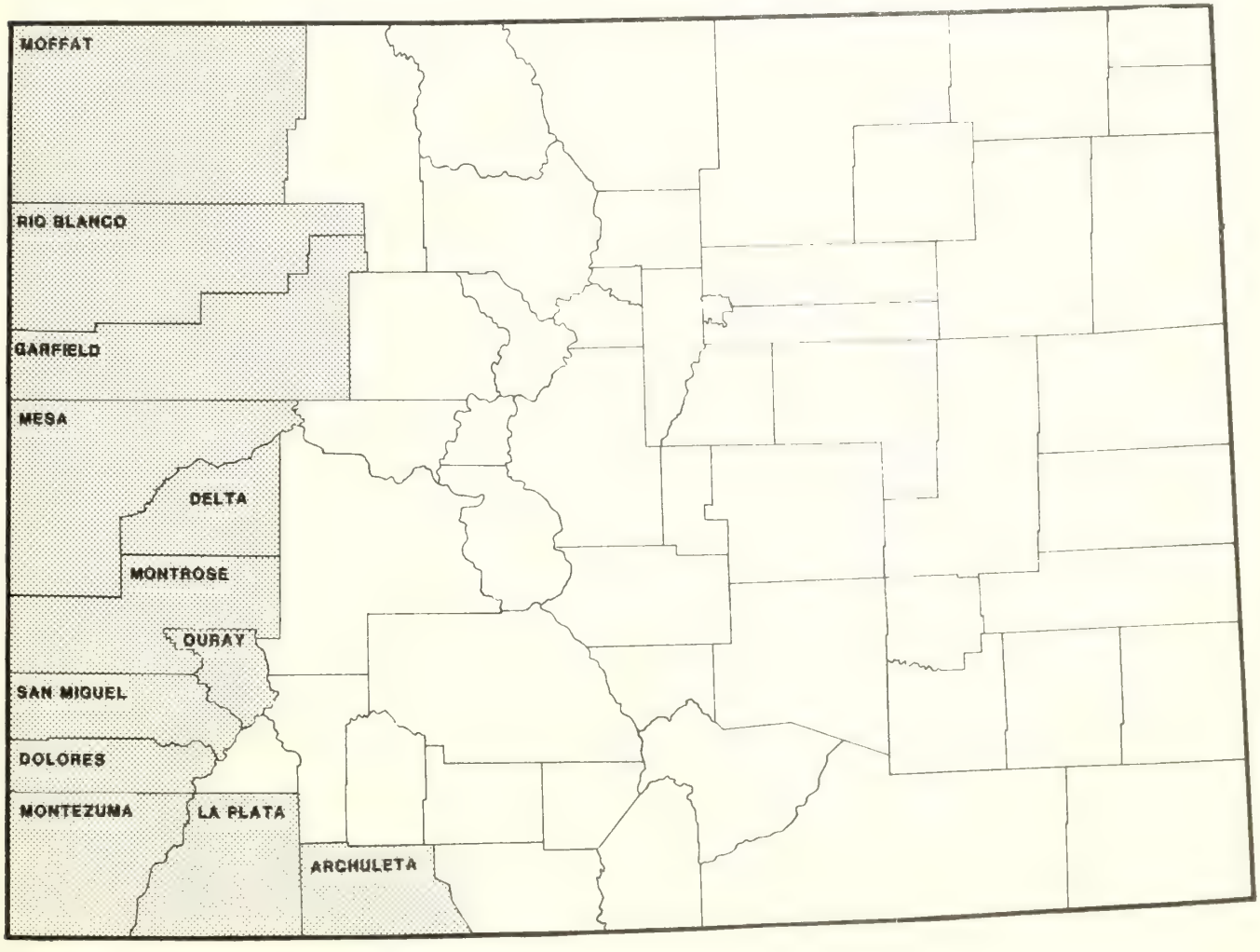

Figure 1—Counties covered by this report.

The Intermountain Research Station with headquarters in Ogden, UT, conducts the forest resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, western South Dakota, Utah, Wyoming, western Texas, and Oklahoma's panhandle. These inventories provide information on the extent and condition of State and privately owned forest lands and most other lands not in the National Forest System, volume of timber, and rates of timber growth, removals, and mortality.

These data, when combined with similar information on National Forest lands, provide a basis for forming forest policies and programs and for the orderly development and use of the resource.

HIGHLIGHTS

Area

- State and private lands comprise 6.7 million acres, or nearly 41 percent of the total land area of western Colorado (fig. 2).
- Forests occupy about 2.3 million acres including reserved land, or 34 percent of the total State and private land area.
- Over 36 percent of the forest land, 811,100 acres, is classified as nonreserved timberland, and 97 percent of this area is privately owned.
- Ponderosa pine forest type occurs on 37 percent of the privately owned timberland, and aspen forest type occurs on 35 percent of the area.
- Woodland forest types on privately owned land are composed of pinyon-juniper type (56 percent), oak type (29 percent), and juniper type (15 percent).

Inventory

- Timberland growing-stock volume is about 1.1 billion cubic feet, and sawtimber volume totals about 3.9 billion board feet (International ¼-inch rule).
- Aspen accounts for 37 percent of the timberland growing stock, ponderosa pine accounts for 32 percent, and Engelmann spruce accounts for 16 percent.
- Pinyon and juniper account for 90 percent of the net cubic-foot woodland volume, while woodland hardwoods compose the remaining 10 percent.
- Net woodland volume is just over 664 million cubic feet, net annual growth is about 8.9 million cubic feet, and annual mortality is 1.8 million cubic feet.
- About 84 percent of the timberland growing stock (920.7 million cubic feet) is in trees less than 19 inches diameter at breast height (d.b.h.).
- Rotten cull and salvable dead trees total 73 million cubic feet, about 7 percent of the timberland sound wood volume.
- Archuleta, Garfield, and La Plata Counties combined account for nearly 51 percent of timberland net volume growing stock and nearly 56 percent of sawtimber net volume.

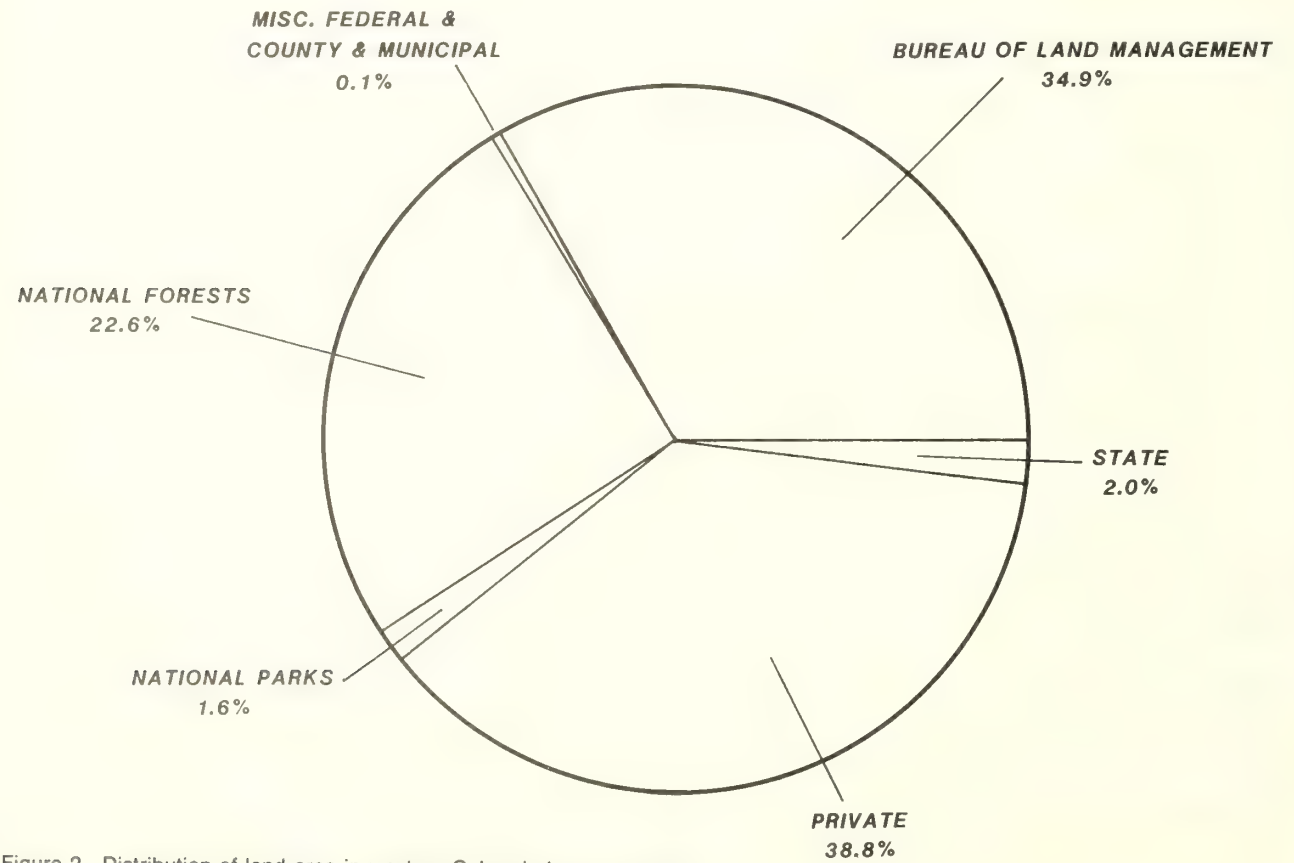

Figure 2—Distribution of land area in western Colorado by owner group.

Components of Change

Growth

- Net annual growth for timberland was nearly 19 million cubic feet, 96 percent of which is on private land.
- About 58 percent of the timberland is capable of producing more than 50 cubic feet of wood per acre per year. Average net annual growth in 1982 was just over 23 cubic feet per acre per year.
- Net annual growth consisted of ponderosa pine (37 percent), Engelmann spruce (22 percent), and aspen (21 percent).
- Woodland net annual growth was about 8.9 million cubic feet, of which 97 percent is on private land.

Mortality

- The annual mortality of 6.6 million cubic feet offsets 26 percent of the timberland gross annual growth.
- Aspen accounts for 5.7 million cubic feet, 87 percent of the timberland annual mortality.

Removals

- An estimated 8.1 million cubic feet of industrial roundwood material (47.8 million board feet, International ¼-inch rule) was harvested in 1982 (includes all land owners in the sample area), 21 percent of which came from State and private land (McLain 1985).
- Of the total cubic-foot roundwood harvest, 75 percent came from Montezuma (37 percent), Montrose (19 percent), and Dolores (19 percent) Counties (McLain 1985) (includes all land owners in the sample area).
- Spruce contributed the largest percentage to the industrial roundwood harvest (36 percent), with aspen and ponderosa pine each contributing 28 percent (McLain 1985).
- Sawlogs accounted for nearly 99 percent of the roundwood volume harvested (includes all land owners in the sample area).
- Total fuelwood harvest was over 88,100 cords (7.1 million cubic feet) in 1982, of which 32 percent was cut from State and private land. This was equal to 87 percent of the roundwood harvest (McLain and Booth 1985).
- Of the fuelwood, 65 percent was harvested from Mesa County, and 71 percent of this volume came from private land (McLain and Booth 1985).
- Ponderosa pine accounted for 33 percent of the total fuelwood harvest, fruit trees 25 percent, and aspen 24 percent (includes all land owners in the sample area) (McLain and Booth 1985).

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics at the State and sample area levels.

Prefield

Primary area estimates were based on the classification of 66,431 sample points systematically placed on the latest aerial photographs available. The photo points, adjusted to meet known land areas, were used to stratify and compute area expansion factors for the field sample data.

Field

Land classification and estimates for timber characteristics and volume were based on observations or measurements or both recorded at 628 ground sample locations, of which 267 were forested. Sample trees were selected using a 5-point sample cluster, which included 1/300-acre fixed radius plots for trees less than 5 inches d.b.h., and 40 basal area factor variable radius plots for trees 5 inches d.b.h. or larger.

Compilation

All photo and field data were loaded onto tape and stored for computer editing, computation, and tabulation. Final estimates from these data were based on statistical summaries, a portion of which is included in this bulletin. Volume and defect were computed using equations developed by Edminster and others (1980, 1981), Kemp (1958), Chojnacky (1985), Meyers (1964), and Meyers and others (1972).

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on very small sample sizes resulting in high sampling errors. The standard error percentages shown in tables 1 and 2 were calculated at the 67 percent confidence level.

TERMINOLOGY AND DATA TABLES

The following section contains definitions that are relevant to the timber resource data in this bulletin. Forest area and timber resource data for western Colorado are displayed in tables 3 through 61.

TERMINOLOGY

Acceptable trees—Growing-stock trees meeting specified standards of size and quality, but not qualifying as desirable trees.

Area condition class—A classification of timberland reflecting the degree to which the site is being utilized by growing-stock trees and other conditions affecting current and prospective timber growth (see Stocking):

Class 10—Areas fully stocked with desirable trees and not overstocked.

Class 20—Areas fully stocked with desirable trees, but overstocked with all live trees.

Class 30—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees, or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Class 40—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees, or conditions that ordinarily prevent occupancy by desirable trees, or both.

Class 50—Areas poorly stocked with desirable trees, but fully stocked with growing-stock trees.

Class 60—Areas poorly stocked with desirable trees, but with medium to full stocking of growing-stock trees.

Class 70—Areas nonstocked or poorly stocked with desirable trees, and poorly stocked with growing-stock trees.

Class 80—Low-risk old-growth stands.

Class 90—High-risk old-growth stands.

Nonstocked—Areas less than 10 percent stocked with growing-stock trees.

Basal area—The cross-sectional area of a tree expressed in square feet. For timber species the calculation is based on diameter at breast height (d.b.h.); for woodland species it is based on diameter at root collar (d.r.c.).

Cord—A pile of stacked wood equivalent to 128 cubic feet of wood and air space having standard dimensions of 4 by 4 by 8 feet.

Cull trees—Live trees that are unmerchantable now or prospectively (see Rough trees and Rotten trees).

Cull volume—Portions of a tree's volume that are not usable for wood products because of rot, form, missing material, or other cubic-foot defect. Form and sound defects include severe sweep and crook, forks, extreme form reduction, large deformities, and dead material.

Deferred forest land—Forest lands within the National Forest System that are under study for possible inclusion in the Wilderness System.

Desirable trees—Growing-stock trees (1) having no serious defect in quality to limit present or prospective use for timber products, (2) of relatively high vigor, and (3) containing no pathogens that may result in death or serious deterioration within the next decade.

Diameter at breast height (d.b.h.)—Diameter of the stem measured at 4.5 feet above the ground.

Diameter at root collar (d.r.c.)—Diameter equivalent at the point nearest the ground line that represents the basal area of the tree stem or stems.

Diameter classes—Tree diameters, either d.b.h. or d.r.c., grouped into 2-inch classes labeled by the midpoint of the class.

Farmer-owned lands—Lands owned by a person who operates a farm and who either does the work or directly supervises the work.

Forest industry lands—Lands owned by companies or individuals operating a primary wood-processing plant.

Forest land—Land at least 10 percent stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.

Forest trees—Woody plants having a well-developed stem or stems, usually more than 12 feet in height at maturity, with a generally well-defined crown.

Forest type—A classification of forest land based upon and named for the tree species presently forming a plurality of live-tree stocking.

Growing-stock trees—Live sawtimber trees, poletimber trees, saplings, and seedlings of timber species meeting specified standards of quality and vigor; excludes cull trees.

Growing-stock volume—Net cubic-foot volume in live growing-stock trees from a 1-foot stump to a minimum 4-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.

Growth—See definition for net annual growth.

Hardwood trees—Dicotyledonous trees, usually broad-leaved and deciduous.

High-risk old-growth stands—Timber stands over 100 years old in which the majority of the trees are not expected to survive more than 10 years.

Indian lands—Indian lands held in trust by the Federal Government.

Industrial wood—All commercial roundwood products except fuelwood.

Land area—The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains, streams, sloughs, estuaries, and canals less than 120 feet wide; and lakes, reservoirs, and ponds less than 1 acre in size.

Logging residues—The unused portions of growing-stock trees cut or killed by logging.

Low-risk old-growth stands—Timber stands over 100 years old in which the majority of the trees are expected to survive more than 10 years.

Miscellaneous Federal lands—Lands administered by Federal agencies other than the U.S. Department of Agriculture, Forest Service or U.S. Department of the Interior, Bureau of Land Management.

Mortality—The net volume of growing-stock trees that have died from natural causes during a specified period.

National Forest lands—Public lands administered by the U.S. Department of Agriculture, Forest Service.

National Resource lands—Public lands administered by the U.S. Department of the Interior, Bureau of Land Management.

Net annual growth—The net average annual increase in the volume of trees during a specified period.

Net volume in board feet—The gross board-foot volume in the sawlog portion of growing-stock trees, less deductions for cull volume.

Net volume in cubic feet—Gross cubic-foot volume in the merchantable portion of trees less deductions for cull volume. For timber species, volume is computed for the merchantable stem from a 1-foot stump to a minimum 4-inch top diameter outside bark, or to the point where the central stem breaks into limbs. For woodland species, volume is computed outside bark (o.b.) for all woody material above d.r.c. that is larger than 1.5 inches in diameter (o.b.).

Nonforest land—Land that does not currently qualify as forest land.

Nonindustrial private—All private ownerships except forest industry.

Nonstocked areas—Forest land less than 10 percent stocked with live trees.

Old-growth stands—Stands of timber species over 100 years old.

Other private land—Privately owned land other than forest industry or farmer-owned.

Other public land—Public land administered by agencies other than the U.S. Department of Agriculture, Forest Service.

Other removals—The net volume of growing-stock trees removed from the inventory by cultural operations such as timber-stand improvement, by land clearing, and by changes in land use such as a shift to wilderness.

Poletimber stands—Stands at least 10 percent stocked with growing-stock trees, in which half or more of the stocking is sawtimber or poletimber trees or both, with poletimber stocking exceeding that of sawtimber (see definition for Stocking).

Poletimber trees—Live trees of timber species at least 5 inches d.b.h. but smaller than sawtimber size.

Potential growth—The average net annual cubic-foot growth per acre at culmination of mean annual growth attainable in fully stocked natural stands.

Primary wood-processing plants—Plants using roundwood products such as sawlogs, pulpwood bolts, veneer logs, etc.

Productivity class—A classification of forest land in terms of potential growth.

Removals—The net volume of growing-stock trees removed from the inventory by harvesting, cultural operations, land clearings, or changes in land use.

Reserved forest land—Forest land withdrawn from tree utilization through statute or administrative designation.

Residues:

Coarse residues—Plant residues suitable for chipping, such as slabs, edgings, and ends.

Fine residues—Plant residues not suitable for chipping, such as sawdust, shavings, and veneer clippings.

Plant residues—Wood materials from primary manufacturing plants that are not used for any product.

Rotten tree—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot) and with more than half of the cull volume attributable to rotten or missing material.

Rough tree—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot) and with less than half of the cull volume attributable to rotten or missing material.

Roundwood—Logs, bolts, or other round sections cut from trees.

Salvable dead trees—Standing or down dead trees that are currently merchantable by regional standards.

Saplings—Live trees of timber species 1 to 4.9 inches d.b.h. or woodland species 1 to 2.9 inches d.r.c.

Sapling and seedling stands—Timberland stands at least 10 percent stocked on which more than half of the stocking is saplings or seedlings or both.

Sawlog portion—That part of the bole of sawtimber trees between a 1-foot stump and the sawlog top.

Sawlog top—The point on the bole of sawtimber trees above which a sawlog cannot be produced. The minimum sawlog top is 7 inches diameter o.b. for softwoods and 9 inches diameter o.b. for hardwoods.

Sawtimber stands—Stands at least 10 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber trees—Live trees of timber species meeting regional size and defect specifications. Softwood trees must be at least 9 inches d.b.h. and hardwood trees 11 inches d.b.h.

Sawtimber volume—Net volume in board feet of the sawlog portion of live sawtimber trees.

Seedlings—Established live trees of timber species less than 1 inch d.b.h. or woodland species less than 1 inch d.r.c.

Softwood trees—Monocotyledonous trees, usually evergreen, having needle or scalelike leaves.

Standard error—An expression of the degree of confidence that can be placed on an estimated total or average obtained by statistical sampling methods. Standard errors do not include technique errors that could occur in photo classification of areas, field measurements, or compilation of data.

Stand-size classes—A classification of forest land based on the predominant size of trees present (see Sawtimber stands, Poletimber stands, and Sapling and seedling stands).

State, county, and municipal lands—Lands administered by States, counties, or local public agencies, or lands leased by these governmental units for more than 50 years.

Stocking—An expression of the extent to which growing space is effectively utilized by present or potential growing-stock trees of timber species. Percentage stocking is the ratio of actual stocking to full stocking for

comparable sites and stands, using basal area as the basis for comparison.

Timberland—Forest land where timber species make up at least 10 percent stocking.

Timber species—Tree species traditionally used for industrial wood products. In the Rocky Mountain States, these include aspen and cottonwood hardwood species and all softwood species except pinyon and juniper.

Timber stand improvement—Treatments such as thinning, pruning, release cutting, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.

Upper-stem portion—That part of the main stem or fork of sawtimber trees above the sawlog top to a minimum top diameter of 4 inches o.b. or to the point where the main stem or fork breaks into limbs.

Water—Streams, sloughs, estuaries, and canals more than 120 feet wide, and lakes, reservoirs, and ponds more than 1 acre in size at mean high water level.

Wilderness—An area of undeveloped land currently included in the Wilderness System, managed so as to preserve its natural conditions and retain its primeval character and influence.

Woodland—Forest land where timber species make up less than 10 percent stocking.

Woodland species dead volume—Net volume of dead woodland trees and dead net volume portion of live woodland tree species.

Woodland species live volume—Net cubic-foot volume in live woodland tree species.

Woodland species—Tree species not usually converted into industrial wood products. Common uses are fuelwood, fenceposts, and Christmas trees.

REFERENCES

Chojnacky, David C. 1985. Pinyon-juniper volume equations for the central Rocky Mountain States. Res. Pap. INT-339. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 27 p.

Edminster, Carleton B.; Mowrer, H. Todd; Hinds, Thomas E. 1981. Volume tables and point-sampling factors for aspen in Colorado. Res. Pap. RM-232. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.

Edminster, Carleton B.; Beeson, Robert T.; Metcalf, Gary E. 1980. Volume tables and point-sampling factors for ponderosa pine in the Front Range of Colorado. Res. Pap. RM-218. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 14 p.

Kemp, Paul D. 1958. Volume tables. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station, Ogden, UT.

McLain, William H. 1985. Colorado's industrial roundwood production and mill residues, 1982. Resour. Bull. INT-35. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 13 p.

McLain, William H.; Booth, Gordon D. 1985. Colorado's 1982 fuelwood harvest. Resour. Bull. INT-36. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 11 p.

Meyers, Clifford A. 1964. Volume tables and point-sampling factors for lodgepole pine in Colorado and Wyoming. Res. Pap. RM-6. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.

Meyers, Clifford A.; Edminster, Carleton B. 1972. Volume tables and point-sampling factors for Engelmann spruce in Colorado and Wyoming. Res. Pap. RM-95. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 23 p.

FOREST SURVEY TABLES

Table 1.--Area of State and privately owned forest land with percent standard error in western Colorado, 1983

Item	Softwoods		Hardwoods		All types	
	Acres	Percent standard error	Acres	Percent standard error	Acres	Percent standard error
Timberland	498,055	±9.2	313,034	±10.1	811,089	±6.5
Woodland	1,015,473	±5.8	419,070	±14.8	1,434,543	±5.3
Reserved forest land:[1]						
Timberland	1,023		916		1,939	
Woodland	1,321		534		1,855	
Total forest land	1,515,872		733,554		2,249,426	

[1]Reserved land areas are estimated from aerial photos without field verification; therefore, standard errors are not calculated.

Table 2.--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on State and privately owned timberland with percent standard error in western Colorado

Item	Softwoods		Hardwoods		All species	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume, 1983:						
Growing stock (M cubic feet)	657,601	±13.6	439,205	±16.2	1,096,806	±10.2
Sawtimber[1] (M board feet)	2,915,760	±14.7	955,063	±26.1	3,870,823	±12.8
Sawtimber[2] (M board feet)	2,502,967	±14.8	810,671	±26.0	3,313,638	±12.9
Net annual growth, 1982:						
Growing stock (M cubic feet)	14,162	±14.0	4,808	±40.0	18,970	±14.3
Sawtimber[1] (M board feet)	66,010	±15.6	51,948	±42.1	117,958	±20.4
Sawtimber[2] (M board feet)	57,879	±15.4	44,313	±41.9	102,192	±20.1
Annual mortality, 1982:						
Growing stock (M cubic feet)	591	±96.7	6,002	±27.0	6,593	±26.1
Sawtimber[1] (M board feet)	2,976	±96.7	6,460	±59.2	9,436	±50.7
Sawtimber[2] (M board feet)	2,390	±96.7	5,468	±58.9	7,858	±50.5

[1]International ¼-inch rule.

[2]Scribner rule.

Table 3.--Total land and water area by ownership class in western Colorado, 1983

Ownership class	Area
	- - Acres - -
Land:	
Public:	
National Forest	3,696,869
National Parks[1]	266,366
Other:	
Bureau of Land Management	5,703,669
Miscellaneous federal	12,357
State	331,497
County and municipal	1,235
Total other public	6,048,758
Total public	10,011,993
Private	6,353,511
Total land area	16,365,504
Census water	52,998
Total land and water[2]	16,418,502

[1]Not included with miscellaneous Federal, a component of other public, for purpose of clarity.

[2]U.S. Bureau of the Census, land and water area of the United States, 1980.

Table 4.--Total land area on State and privately owned land by major land class and ownership class in western Colorado, 1983

Land class	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - Acres - - - - - - - - -		
Timberland:			
Reserved	1,939	--	1,939
Nonreserved	27,814	783,275	811,089
Total	29,753	783,275	813,028
Woodland:			
Reserved	1,855	--	1,855
Nonreserved	52,654	1,381,889	1,434,543
Total	54,509	1,381,889	1,436,398
Total forest land:			
Reserved	3,794	--	3,794
Nonreserved	80,468	2,165,164	2,245,632
Total	84,262	2,165,164	2,249,426
Nonforest land	247,235	4,188,347	4,435,582
Total land area	331,497	6,353,511	6,685,008

Table 5.--Area of forest land on State and privately owned land by forest type, ownership class, and land class in western Colorado, 1983

Forest type	Ownership class and land class						
	State		Nonindustrial private		All owners		
	Reserved	Nonreserved	Reserved	Nonreserved	Reserved	Nonreserved	Total
	Acres						
Douglas-fir	578	3,939	--	93,228	578	97,167	97,745
Ponderosa pine	445	10,783	--	293,090	445	303,873	304,318
White fir	--	716	--	21,547	--	22,263	22,263
Spruce	--	3,538	--	71,214	--	74,752	74,752
Aspen	471	8,124	--	276,394	471	284,518	284,989
Cottonwood	445	714	--	27,802	445	28,516	28,961
Total timberland	1,939	27,814	--	783,275	1,939	811,089	813,028
Pinyon-juniper	1,321	28,369	--	774,752	1,321	803,121	804,442
Juniper	--	11,444	--	200,908	--	212,352	212,352
Oak	534	12,841	--	406,229	534	419,070	419,604
Total woodland	1,855	52,654	--	1,381,889	1,855	1,434,543	1,436,398
Total all types	3,794	80,468	--	2,165,164	3,794	2,245,632	2,249,426

Table 6.--Cubic feet of net volume in trees on State and privately owned forest land by species and ownership class in western Colorado, 1983

Species	Ownership class		
	State	Nonindustrial private	Total
	Thousand cubic feet		
Douglas-fir	3,277	91,022	94,299
Ponderosa pine	12,497	340,313	352,810
Subalpine fir	378	8,938	9,316
White fir	881	25,218	26,099
Engelmann spruce	8,773	166,430	175,203
Aspen	11,853	388,574	400,427
Cottonwood	1,177	37,601	38,778
Total timberland species	38,836	1,058,096	1,096,932
Pinyon/juniper	21,673	590,671	612,344
Woodland hardwoods	2,346	79,363	81,709
Total woodland species	24,019	670,034	694,053
Total all species	62,855	1,728,130	1,790,985

Table 7.--Cubic feet of net annual growth in trees on State and privately owned forest land by species and ownership class in western Colorado, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Douglas-fir	102	2,781	2,883
Ponderosa pine	251	6,703	6,954
Subalpine fir	-5	-150	-155
White fir	15	433	448
Engelmann spruce	207	3,950	4,157
Aspen	139	3,806	3,945
Cottonwood	29	834	863
Total timberland species	738	18,357	19,095
Pinyon/juniper	132	4,848	4,980
Woodland hardwoods	113	3,873	3,986
Total woodland species	245	8,721	8,966
Total all species	983	27,078	28,061

Table 8.--Cubic feet of annual mortality in trees on State and privately owned forest land by species and ownership class in western Colorado, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Subalpine fir	20	571	591
Aspen	172	5,567	5,739
Cottonwood	--	263	263
Total timberland species	192	6,401	6,593
Pinyon/juniper	116	1,473	1,589
Woodland hardwoods	9	368	377
Total woodland species	125	1,841	1,966
Total all species	317	8,242	8,559

Table 9.--Area of State and privately owned timberland by forest type, stand-size class, and productivity class in western Colorado, 1983

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	Acres				
Douglas-fir:					
Sawtimber	--	59,752	25,379	--	85,131
Poletimber	--	--	12,036	--	12,036
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	59,752	37,415	--	97,167
Ponderosa pine:					
Sawtimber	18,669	136,945	128,989	--	284,603
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	19,270	--	--	19,270
Total	18,669	156,215	128,989	--	303,873
White fir:					
Sawtimber	--	12,037	--	--	12,037
Poletimber	--	--	--	--	--
Sapling and seedling	10,226	--	--	--	10,226
Nonstocked	--	--	--	--	--
Total	10,226	12,037	--	--	22,263
Spruce:					
Sawtimber	18,668	56,084	--	--	74,752
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	18,668	56,084	--	--	74,752
Aspen:					
Sawtimber	20,453	22,502	34,933	--	77,888
Poletimber	--	54,205	129,923	--	184,128
Sapling and seedling	--	11,251	11,251	--	22,502
Nonstocked	--	--	--	--	--
Total	20,453	87,958	176,107	--	284,518
Cottonwood:					
Sawtimber	--	28,516	--	--	28,516
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	28,516	--	--	28,516
All types:					
Sawtimber	57,790	315,836	189,301	--	562,927
Poletimber	--	54,205	141,959	--	196,164
Sapling and seedling	10,226	11,251	11,251	--	32,728
Nonstocked	--	19,270	--	--	19,270
Total	68,016	400,562	342,511	--	811,089

Table 10.--Area of State owned timberland by forest type, stand-size class, and productivity class in western Colorado, 1983

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	Acres				
Douglas-fir:					
Sawtimber	--	1,673	1,864	--	3,537
Poletimber	--	--	402	--	402
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	1,673	2,266	--	3,939
Ponderosa pine:					
Sawtimber	636	3,916	5,748	--	10,300
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	483	--	--	483
Total	636	4,399	5,748	--	10,783
White fir:					
Sawtimber	--	402	--	--	402
Poletimber	--	--	--	--	--
Sapling and seedling	314	--	--	--	314
Nonstocked	--	--	--	--	--
Total	314	402	--	--	716
Spruce:					
Sawtimber	636	2,902	--	--	3,538
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	636	2,902	--	--	3,538
Aspen:					
Sawtimber	629	527	923	--	2,079
Poletimber	--	1,419	4,098	--	5,517
Sapling and seedling	--	264	264	--	528
Nonstocked	--	--	--	--	--
Total	629	2,210	5,285	--	8,124
Cottonwood:					
Sawtimber	--	714	--	--	714
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	714	--	--	714
All types:					
Sawtimber	1,901	10,134	8,535	--	20,570
Poletimber	--	1,419	4,500	--	5,919
Sapling and seedling	314	264	264	--	842
Nonstocked	--	483	--	--	483
Total	2,215	12,300	13,299	--	27,814

Table 11.--Area of nonindustrial privately owned timberland by forest type, stand-size class, and productivity class in western Colorado, 1983

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	Acres				
Douglas-fir:					
Sawtimber	--	58,079	23,515	--	81,594
Poletimber	--	--	11,634	--	11,634
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	58,079	35,149	--	93,228
Ponderosa pine:					
Sawtimber	18,033	133,029	123,241	--	274,303
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	18,787	--	--	18,787
Total	18,033	151,816	123,241	--	293,090
White fir:					
Sawtimber	--	11,635	--	--	11,635
Poletimber	--	--	--	--	--
Sapling and seedling	9,912	--	--	--	9,912
Nonstocked	--	--	--	--	--
Total	9,912	11,635	--	--	21,547
Spruce:					
Sawtimber	18,032	53,182	--	--	71,214
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	18,032	53,182	--	--	71,214
Aspen:					
Sawtimber	19,824	21,975	34,010	--	75,809
Poletimber	--	52,786	125,825	--	178,611
Sapling and seedling	--	10,987	10,987	--	21,974
Nonstocked	--	--	--	--	--
Total	19,824	85,748	170,822	--	276,394
Cottonwood:					
Sawtimber	--	27,802	--	--	27,802
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	27,802	--	--	27,802
All types:					
Sawtimber	55,889	305,702	180,766	--	542,357
Poletimber	--	52,786	137,459	--	190,245
Sapling and seedling	9,912	10,987	10,987	--	31,886
Nonstocked	--	18,787	--	--	18,787
Total	65,801	388,262	329,212	--	783,275

Table 12.--Area of State and privately owned timberland by stand volume and ownership class in western Colorado, 1983

Stand volume per acre[1]	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - Acres - - - - - - - -		
Less than 1,500 board feet	5,572	193,735	199,307
1,500 to 4,999 board feet	10,092	259,620	269,712
5,000 to 9,999 board feet	9,419	260,123	269,542
10,000 board feet or more	2,731	69,797	72,528
All classes	27,814	783,275	811,089

[1]International ¼-inch rule.

Table 13.--Area of State and privately owned timberland by forest type and area condition class in western Colorado, 1983

Forest type	Area condition class										
	10	20	30	40	50	60	70	80	90	Nonstocked	All classes
	- - - - - - - -

Table 14.--Number of growing-stock trees on State and privately owned timberland by species and diameter class in western Colorado, 1983

Species	Diameter class (inches at breast height)															
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand trees															
Douglas-fir	--	2,242	6,294	2,555	1,186	778	420	451	147	109	55	30	--	--	23	14,290
Ponderosa pine	--	--	584	3,654	3,552	4,666	4,364	2,375	821	285	--	211	--	114	114	20,740
Subalpine fir	1,023	1,023	--	550	199	263	--	83	--	--	--	--	--	--	--	3,141
White fir	8,362	--	--	495	218	--	178	99	--	69	--	51	--	60	--	9,532
Engelmann spruce	12,689	5,010	500	2,190	1,925	1,066	567	407	424	313	126	206	151	34	54	25,662
Total softwoods	22,074	8,275	7,378	9,444	7,080	6,773	5,529	3,415	1,392	776	181	498	151	208	191	73,365
Aspen	21,735	24,783	29,074	13,603	11,044	4,144	2,755	1,023	258	--	37	--	--	--	--	108,456
Cottonwood	9,593	--	1,157	1,037	366	602	116	241	60	161	113	--	--	--	26	13,472
Total hardwoods	31,328	24,783	30,231	14,640	11,410	4,746	2,871	1,264	318	161	150	--	--	--	26	121,928
All species	53,402	33,058	37,609	24,084	18,490	11,519	8,400	4,679	1,710	937	331	498	151	208	217	195,293

Table 15.--Number of cull and salvable dead trees on State and privately owned timberland by ownership class, and softwoods and hardwoods in western Colorado, 1983

Ownership class and species group	Cull trees			Salvable dead trees	All dead trees
	Sound	Rotten	Total		
	- - - - - - - - - - Thousand trees - - - - - - - - - -				
State:					
Softwoods	--	3	3	36	39
Hardwoods	--	42	42	459	501
Total	--	45	45	495	540
Nonindustrial private:					
Softwoods	--	92	92	834	926
Hardwoods	--	1,662	1,662	15,151	16,813
Total	--	1,754	1,754	15,985	17,739
Total:					
Softwoods	--	95	95	870	965
Hardwoods	--	1,704	1,704	15,610	17,314
Total	--	1,799	1,799	16,480	18,279

Table 16.--Net volume of growing stock on State and privately owned timberland by ownership class, forest type, and stand-size class in western Colorado, 1983

Ownership class	Forest type	Stand-size class				
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	All classes
		- - - - - - - - - - - - - - Thousand cublic feet - - - - - - - - - - - -				
State:						
	Douglas-fir	3,303	316	--	--	3,619
	Ponderosa pine	11,953	--	--	113	12,066
	White fir	890	--	81	--	971
	Spruce	9,640	--	--	--	9,640
	Aspen	4,569	6,624	561	--	11,754
	Cottonwood	783	--	--	--	783
	All types	31,138	6,940	642	113	38,833
Nonindustrial private:						
	Douglas-fir	88,130	9,153	--	--	97,283
	Ponderosa pine	328,281	--	--	4,378	332,659
	White fir	25,792	--	2,544	--	28,336
	Spruce	182,047	--	--	--	182,047
	Aspen	173,227	190,556	23,384	--	387,167
	Cottonwood	30,481	--	--	--	30,481
	All types	827,958	199,709	25,928	4,378	1,057,973
Total:						
	Douglas-fir	91,433	9,469	--	--	100,902
	Ponderosa pine	340,234	--	--	4,491	344,725
	White fir	26,682	--	2,625	--	29,307
	Spruce	191,687	--	--	--	191,687
	Aspen	177,796	197,180	23,945	--	398,921
	Cottonwood	31,264	--	--	--	31,264
	All types	859,096	206,649	26,570	4,491	1,096,806

Table 17.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class, forest type, and stand-size class in western Colorado, 1983

Ownership class	Forest type	Stand-size class				
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	All classes
		Thousand board feet, International ¼-inch rule				
State:						
	Douglas-fir	12,777	787	--	--	13,564
	Ponderosa pine	53,552	--	--	513	54,065
	White fir	2,117	--	--	--	2,117
	Spruce	44,442	--	--	--	44,442
	Aspen	15,842	7,697	--	--	23,539
	Cottonwood	2,898	--	--	--	2,898
	All types	131,628	8,484	--	513	140,625
Nonindustrial private:						
	Douglas-fir	316,292	22,806	--	--	339,098
	Ponderosa pine	1,502,081	--	--	19,942	1,522,023
	White fir	61,316	--	--	--	61,316
	Spruce	847,759	--	--	--	847,759
	Aspen	603,787	243,420	--	--	847,207
	Cottonwood	112,795	--	--	--	112,795
	All types	3,444,030	266,226	--	19,942	3,730,198
Total:						
	Douglas-fir	329,069	23,593	--	--	352,662
	Ponderosa pine	1,555,633	--	--	20,455	1,576,088
	White fir	63,433	--	--	--	63,433
	Spruce	892,201	--	--	--	892,201
	Aspen	619,629	251,117	--	--	870,746
	Cottonwood	115,693	--	--	--	115,693
	All types	3,575,658	274,710	--	20,455	3,870,823

Table 18.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by ownership class, forest type, and stand-size class in western Colorado, 1983

Ownership class	Forest type	Stand-size class				
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	All classes
		Thousand board feet, Scribner rule				
State:						
	Douglas-fir	10,863	654	--	--	11,517
	Ponderosa pine	45,900	--	--	421	46,321
	White fir	1,752	--	--	--	1,752
	Spruce	38,157	--	--	--	38,157
	Aspen	13,400	6,523	--	--	19,923
	Cottonwood	2,443	--	--	--	2,443
	All types	112,515	7,177	--	421	120,113
Nonindustrial private:						
	Douglas-fir	269,728	18,929	--	--	288,657
	Ponderosa pine	1,293,902	--	--	16,392	1,310,294
	White fir	50,755	--	--	--	50,755
	Spruce	730,903	--	--	--	730,903
	Aspen	511,005	206,839	--	--	717,844
	Cottonwood	95,072	--	--	--	95,072
	All types	2,951,365	225,768	--	16,392	3,193,525
Total:						
	Douglas-fir	280,591	19,583	--	--	300,174
	Ponderosa pine	1,339,802	--	--	16,813	1,356,615
	White fir	52,507	--	--	--	52,507
	Spruce	769,060	--	--	--	769,060
	Aspen	524,405	213,362	--	--	737,767
	Cottonwood	97,515	--	--	--	97,515
	All types	3,063,880	232,945	--	16,813	3,313,638

Table 19.--Net volume of growing stock on State and privately owned timberland by ownership class and species in western Colorado, 1983

Species	Ownership class		
	State	Nonindustrial private	Total
	Thousand cubic feet		
Douglas-fir	3,272	90,901	94,173
Ponderosa pine	12,497	340,313	352,810
Subalpine fir	378	8,938	9,316
White fir	882	25,217	26,099
Engelmann spruce	8,773	166,430	175,203
Total softwoods	25,802	631,799	657,601
Aspen	11,854	388,573	400,427
Cottonwood	1,177	37,601	38,778
Total hardwoods	13,031	426,174	439,205
All species	38,833	1,057,973	1,096,806

Table 20.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class and species in western Colorado, 1983

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - Thousand board feet, International ¼-inch rule - - -		
Douglas-fir	12,572	331,195	343,767
Ponderosa pine	56,198	1,565,365	1,621,563
Subalpine fir	1,326	28,668	29,994
White fir	3,567	101,894	105,461
Engelmann spruce	40,403	774,572	814,975
Total softwoods	114,066	2,801,694	2,915,760
Aspen	21,864	786,801	808,665
Cottonwood	4,695	141,703	146,398
Total hardwoods	26,559	928,504	955,063
All species	140,625	3,730,198	3,870,823

Table 21.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by ownership class and species in western Colorado, 1983

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - Thousand board feet, Scribner rule - - - -		
Douglas-fir	10,623	280,460	291,083
Ponderosa pine	48,182	1,348,270	1,396,452
Subalpine fir	1,128	24,600	25,728
White fir	3,005	85,841	88,846
Engelmann spruce	34,611	666,247	700,858
Total softwoods	97,549	2,405,418	2,502,967
Aspen	18,530	667,463	685,993
Cottonwood	4,034	120,644	124,678
Total hardwoods	22,564	788,107	810,671
All species	120,113	3,193,525	3,313,638

Table 22.--Net volume of growing stock on State and privately owned timberland by species and diameter class in western Colorado, 1983

Species	Diameter class (inches at breast height)													All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0	
	Thousand cubic feet													
Douglas-fir	12,842	11,057	13,092	11,690	9,931	13,382	5,992	6,219	3,585	1,671	--	--	4,712	94,173
Ponderosa pine	1,491	15,600	28,749	59,201	93,634	69,136	31,414	14,950	--	13,274	--	9,854	15,507	352,810
Subalpine fir	--	2,084	1,645	3,738	--	1,849	--	--	--	--	--	--	--	9,316
White fir	--	2,628	1,032	--	4,943	4,250	--	3,622	--	3,705	--	5,919	--	26,099
Engelmann spruce	1,006	11,669	18,440	18,543	13,462	12,822	22,937	18,711	10,322	17,785	13,434	5,833	10,239	175,203
Total softwoods	15,339	43,038	62,958	93,172	121,970	101,439	60,343	43,502	13,907	36,435	13,434	21,606	30,458	657,601
Aspen	54,524	66,643	115,234	64,816	61,944	26,883	8,499	--	1,884	--	--	--	--	400,427
Cottonwood	1,696	3,545	3,092	7,517	1,755	5,049	1,264	6,060	4,829	--	--	--	3,971	38,778
Total hardwoods	56,220	70,188	118,326	72,333	63,699	31,932	9,763	6,060	6,713	--	--	--	3,971	439,205
All species	71,559	113,226	181,284	165,505	185,669	133,371	70,106	49,562	20,620	36,435	13,434	21,606	34,429	1,096,806

Table 23.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by species and diameter class in western Colorado, 1983

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	50,145	53,094	49,583	68,725	31,676	33,771	19,701	8,949	--	--	28,123	343,767
Ponderosa pine	95,678	254,251	461,448	356,006	165,633	80,199	--	71,138	--	53,023	84,187	1,621,563
Subalpine fir	4,814	16,463	--	8,717	--	--	--	--	--	--	--	29,994
White fir	3,056	--	24,084	20,352	--	15,986	--	16,040	--	25,943	--	105,461
Engelmann spruce	69,061	85,628	65,354	63,057	116,850	95,962	55,118	96,065	73,415	33,960	60,505	814,975
Total softwoods	222,754	409,436	600,469	516,857	314,159	225,918	74,819	192,192	73,415	112,926	172,815	2,915,760
Aspen	XXXXX	309,268	311,228	135,659	43,067	--	9,443	--	--	--	--	808,665
Cottonwood	XXXXX	38,145	8,847	24,742	5,921	28,240	21,989	--	--	--	18,514	146,398
Total hardwoods	XXXXX	347,413	320,075	160,401	48,988	28,240	31,432	--	--	--	18,514	955,063
All species	222,754	756,849	920,544	677,258	363,147	254,158	106,251	192,192	73,415	112,926	191,329	3,870,823

Table 24.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by species and diameter class in western Colorado, 1983

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Douglas-fir	44,092	45,667	41,112	56,317	25,653	28,524	17,100	7,589	--	--	25,029	291,083
Ponderosa pine	75,542	211,500	397,940	310,412	145,406	70,783	--	62,939	--	47,047	74,883	1,396,452
Subalpine fir	4,284	14,216	--	7,228	--	--	--	--	--	--	--	25,728
White fir	2,439	--	19,770	16,443	--	12,843	--	14,262	--	23,089	--	88,846
Engelmann spruce	61,097	72,505	54,124	51,489	97,204	81,261	48,915	84,972	65,217	30,225	53,849	700,858
Total softwoods	187,454	343,888	512,946	441,889	268,263	193,411	66,015	169,762	65,217	100,361	153,761	2,502,967
Aspen	XXXXX	264,672	262,502	114,234	36,517	--	8,068	--	--	--	--	685,993
Cottonwood	XXXXX	30,548	7,286	21,081	5,072	24,808	19,405	--	--	--	16,478	124,678
Total hardwoods	XXXXX	295,220	269,788	135,315	41,589	24,808	27,473	--	--	--	16,478	810,671
All species	187,454	639,108	782,734	577,204	309,852	218,219	93,488	169,762	65,217	100,361	170,239	3,313,638

Table 25.--Net volume of timber on State and privately owned timberland by class of timber, and softwoods and hardwoods in western Colorado, 1983

Class of timber	Softwoods	Hardwoods	All classes
	- - - - - - - Thousand cubic feet - - - - - - -		
Sawtimber trees:			
Saw-log portion	527,766	145,590	673,356
Upper-stem portion	71,458	48,881	120,339
Total	599,224	194,471	793,695
Poletimber trees	58,377	244,734	303,111
All growing stock trees	657,601	439,205	1,096,806
Sound cull trees	--	--	--
Rotten cull trees	2,279	6,567	8,846
Salvable dead trees	21,801	42,357	64,158
All timber	681,681	488,129	1,169,810

Table 26.--Net volume of growing stock on State and privately owned timberland by forest type and species in western Colorado, 1983

Forest type	Species									
	Douglas-fir	Ponderosa pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	- Thousand cubic feet -									
Douglas-fir	71,953	5,782	4,728	--	17,056	99,519	1,383	--	1,383	100,902
Ponderosa pine	1,827	340,747	--	--	--	342,574	--	2,151	2,151	344,725
White fir	5,127	--	--	10,780	1,926	17,833	11,474	--	11,474	29,307
Spruce	10,759	4,090	1,849	15,319	152,037	184,054	2,270	5,363	7,633	191,687
Aspen	4,507	2,191	2,739	--	4,184	13,621	385,300	--	385,300	398,921
Cottonwood	--	--	--	--	--	--	--	31,264	31,264	31,264
All types	94,173	352,810	9,316	26,099	175,203	657,601	400,427	38,778	439,205	1,096,806

Table 27.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by forest type and species in western Colorado, 1983

Forest type	Species									
	Douglas-fir	Ponderosa pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	Thousand board feet, International ¼-inch rule									
Douglas-fir	237,128	26,750	12,125	--	76,659	352,662	--	--	--	352,662
Ponderosa pine	9,033	1,560,813	--	--	--	1,569,846	--	6,242	6,242	1,576,088
White fir	26,763	--	--	36,670	--	63,433	--	--	--	63,433
Spruce	50,743	22,151	8,717	68,791	717,336	867,738	--	24,463	24,463	892,201
Aspen	20,100	11,849	9,152	--	20,980	62,081	808,665	--	808,665	870,746
Cottonwood	--	--	--	--	--	--	--	115,693	115,693	115,693
All types	343,767	1,621,563	29,994	105,461	814,975	2,915,760	808,665	146,398	955,063	3,870,823

Table 28.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by forest type and species in western Colorado, 1983

Forest type	Species									
	Douglas-fir	Ponderosa pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	Thousand board feet, Scribner rule									
Douglas-fir	200,620	22,714	10,723	--	66,117	300,174	--	--	--	300,174
Ponderosa pine	7,503	1,343,616	--	--	--	1,351,119	--	5,496	5,496	1,356,615
White fir	21,817	--	--	30,690	--	52,507	--	--	--	52,507
Spruce	44,560	19,599	7,228	58,156	617,850	747,393	--	21,667	21,667	769,060
Aspen	16,583	10,523	7,777	--	16,891	51,774	685,993	--	685,993	737,767
Cottonwood	--	--	--	--	--	--	--	97,515	97,515	97,515
All types	291,083	1,396,452	25,728	88,846	700,858	2,502,967	685,993	124,678	810,671	3,313,638

Table 29.--Net annual growth of growing stock on State and privately owned timberland by ownership class and species in western Colorado, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - Thousand cubic feet - - - - - - - - -		
Douglas-fir	98	2,660	2,758
Ponderosa pine	252	6,702	6,954
Subalpine fir	-5	-150	-155
White fir	15	433	448
Engelmann spruce	207	3,950	4,157
Total softwoods	567	13,595	14,162
Aspen	139	3,806	3,945
Cottonwood	29	834	863
Total hardwoods	168	4,640	4,808
All species	735	18,235	18,970

Table 30.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class and species in western Colorado, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - Thousand board feet, International ¼-inch rule - -		
Douglas-fir	212	6,861	7,073
Ponderosa pine	1,280	34,614	35,894
Subalpine fir	-61	-1,806	-1,867
White fir	160	4,616	4,776
Engelmann spruce	1,009	19,125	20,134
Total softwoods	2,600	63,410	66,010
Aspen	974	39,931	40,905
Cottonwood	311	10,732	11,043
Total hardwoods	1,285	50,663	51,948
All species	3,885	114,073	117,958

Table 31.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland by ownership class and species in western Colorado, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - Thousand board feet, Scribner rule - - - -		
Douglas-fir	173	5,610	5,783
Ponderosa pine	1,173	31,602	32,775
Subalpine fir	-48	-1,430	-1,478
White fir	128	3,702	3,830
Engelmann spruce	846	16,123	16,969
Total softwoods	2,272	55,607	57,879
Aspen	844	34,575	35,419
Cottonwood	254	8,640	8,894
Total hardwoods	1,098	43,215	44,313
All species	3,370	98,822	102,192

Table 32.--Net annual growth of growing stock on State and privately owned timberland by species and diameter class in western Colorado, 1982

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand cubic feet													
Douglas-fir	827	602	407	329	140	237	73	69	37	16	--	--	21	2,758
Ponderosa pine	15	432	775	1,406	1,998	1,310	602	142	--	122	--	75	77	6,954
Subalpine fir	--	169	142	118	--	7	-591	--	--	--	--	--	--	-155
White fir	--	29	36	--	123	113	--	77	--	21	--	49	--	448
Engelmann spruce	17	554	738	882	417	289	381	146	172	221	182	95	63	4,157
Total softwoods	859	1,786	2,098	2,735	2,678	1,956	465	434	209	380	182	219	161	14,162
Aspen	2,116	346	561	502	683	-334	58	--	13	--	--	--	--	3,945
Cottonwood	70	210	131	238	62	187	5	180	37	-263	--	--	6	863
Total hardwoods	2,186	556	692	740	745	-147	63	180	50	-263	--	--	6	4,808
All species	3,045	2,342	2,790	3,475	3,423	1,809	528	614	259	117	182	219	167	18,970

Table 33.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland by species and diameter class in western Colorado, 1982

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	1,721	1,918	806	1,354	416	410	237	80	--	--	131	7,073
Ponderosa pine	2,829	8,281	11,588	7,511	3,398	786	--	668	--	409	424	35,894
Subalpine fir	406	666	--	36	-2,975	--	--	--	--	--	--	-1,867
White fir	3,056	--	617	491	--	290	--	88	--	234	--	4,776
Engelmann spruce	3,993	4,905	2,268	1,511	2,039	819	1,058	1,382	1,160	608	391	20,134
Total softwoods	12,005	15,770	15,279	10,903	2,878	2,305	1,295	2,218	1,160	1,251	946	66,010
Aspen	XXXXX	38,273	3,824	-1,542	286	--	64	--	--	--	--	40,905
Cottonwood	XXXXX	10,140	307	838	18	735	149	-1,175	--	--	31	11,043
Total hardwoods	XXXXX	48,413	4,131	-704	304	735	213	-1,175	--	--	31	51,948
All species	12,005	64,183	19,410	10,199	3,182	3,040	1,508	1,043	1,160	1,251	977	117,958

Table 34.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland by species and diameter class in western Colorado, 1982

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Douglas-fir	1,462	1,509	634	1,065	327	356	234	79	--	--	117	5,783
Ponderosa pine	3,181	7,415	10,372	6,721	3,041	704	--	597	--	366	378	32,775
Subalpine fir	362	522	--	28	-2,390	--	--	--	--	--	--	-1,478
White fir	2,439	--	484	384	--	227	--	88	--	208	--	3,830
Engelmann spruce	3,484	3,876	1,780	1,187	1,727	733	969	1,280	1,044	541	348	16,969
Total softwoods	10,928	13,322	13,270	9,385	2,705	2,020	1,203	2,044	1,044	1,115	843	57,879
Aspen	XXXXX	33,070	3,301	-1,256	249	--	55	--	--	--	--	35,419
Cottonwood	XXXXX	8,020	284	776	17	674	136	-1,040	--	--	27	8,894
Total hardwoods	XXXXX	41,090	3,585	-480	266	674	191	-1,040	--	--	27	44,313
All species	10,928	54,412	16,855	8,905	2,971	2,694	1,394	1,004	1,044	1,115	870	102,192

Table 35.--Annual mortality of growing stock on State and privately owned timberland by ownership class and species in western Colorado, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Subalpine fir	20	571	591
Total softwoods	20	571	591
Aspen	172	5,567	5,739
Cottonwood	--	263	263
Total hardwoods	172	5,830	6,002
All species	192	6,401	6,593

Table 36.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class and species in western Colorado, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
	- - Thousand board feet, International ¼-inch rule - -		
Subalpine fir	100	2,876	2,976
Total softwoods	100	2,876	2,976
Aspen	142	5,143	5,285
Cottonwood	--	1,175	1,175
Total hardwoods	142	6,318	6,460
All species	242	9,194	9,436

Table 37.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by ownership class and species in western Colorado, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - Thousand board feet, Scribner rule - - - -		
Subalpine fir	80	2,310	2,390
Total softwoods	80	2,310	2,390
Aspen	119	4,309	4,428
Cottonwood	--	1,040	1,040
Total hardwoods	119	5,349	5,468
All species	199	7,659	7,858

Table 38.--Annual mortality of growing stock on State and privately owned timberland by species and diameter class in western Colorado, 1982

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	- Thousand cubic feet -													
Subalpine fir	--	--	--	--	--	--	591	--	--	--	--	--	--	591
Total softwoods	--	--	--	--	--	--	591	--	--	--	--	--	--	591
Aspen	1,881	1,491	1,312	495	--	560	--	--	--	--	--	--	--	5,739
Cottonwood	--	--	--	--	--	--	--	--	--	263	--	--	--	263
Total hardwoods	1,881	1,491	1,312	495	--	560	--	--	--	263	--	--	--	6,002
All species	1,881	1,491	1,312	495	--	560	591	--	--	263	--	--	--	6,593

Table 39.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by species and diameter class in western Colorado, 1982

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Subalpine fir	--	--	--	--	2,976	--	--	--	--	--	--	2,976
Total softwoods	--	--	--	--	2,976	--	--	--	--	--	--	2,976
Aspen	XXXXX	2,544	--	2,741	--	--	--	--	--	--	--	5,285
Cottonwood	XXXXX	--	--	--	--	--	--	1,175	--	--	--	1,175
Total hardwoods	XXXXX	2,544	--	2,741	--	--	--	1,175	--	--	--	6,460
All species	--	2,544	--	2,741	2,976	--	--	1,175	--	--	--	9,436

Table 40.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by species and diameter class in western Colorado, 1982

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Subalpine fir	--	--	--	--	2,390	--	--	--	--	--	--	2,390
Total softwoods	--	--	--	--	2,390	--	--	--	--	--	--	2,390
Aspen	XXXXX	2,127	--	2,301	--	--	--	--	--	--	--	4,428
Cottonwood	XXXXX	--	--	--	--	--	--	1,040	--	--	--	1,040
Total hardwoods	XXXXX	2,127	--	2,301	--	--	--	1,040	--	--	--	5,468
All species	--	2,127	--	2,301	2,390	--	--	1,040	--	--	--	7,858

Table 41.--Annual mortality of growing stock on State and privately owned timberland by cause of death and species in western Colorado, 1982

Species	Cause of Death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand cubic feet								
Subalpine fir	591	--	--	--	--	--	--	--	591
Total softwoods	591	--	--	--	--	--	--	--	591
Aspen	--	1,669	--	248	229	--	--	3,593	5,739
Cottonwood	--	--	--	--	--	--	--	263	263
Total hardwoods	--	1,669	--	248	229	--	--	3,856	6,002
All species	591	1,669	--	248	229	--	--	3,856	6,593

Table 42.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by cause of death and species in western Colorado, 1982

Species	Cause of Death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand board feet, International ¼-inch rule								
Subalpine fir	2,976	--	--	--	--	--	--	--	2,976
Total softwoods	2,976	--	--	--	--	--	--	--	2,976
Aspen	--	--	--	--	--	--	--	5,285	5,285
Cottonwood	--	--	--	--	--	--	--	1,175	1,175
Total hardwoods	--	--	--	--	--	--	--	6,460	6,460
All species	2,976	--	--	--	--	--	--	6,460	9,436

Table 43.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by cause of death and species in western Colorado, 1982

Species	Cause of Death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand board feet, Scribner rule								
Subalpine fir	2,390	--	--	--	--	--	--	--	2,390
Total softwoods	2,390	--	--	--	--	--	--	--	2,390
Aspen	--	--	--	--	--	--	--	4,428	4,428
Cottonwood	--	--	--	--	--	--	--	1,040	1,040
Total hardwoods	--	--	--	--	--	--	--	5,468	5,468
All species	2,390	--	--	--	--	--	--	5,468	7,858

Table 44.--Area of State and privately owned woodland by ownership class and forest type in western Colorado, 1983

Forest type	Ownership class		
	State	Nonindustrial private	Total
	Acres		
Pinyon-juniper	28,368	774,752	803,120
Juniper	11,445	200,908	212,353
Total woodland softwoods	39,813	975,660	1,015,473
Oak	12,841	406,229	419,070
Riparian	--	--	--
Other west hardwoods	--	--	--
Total woodland hardwoods	12,841	406,229	419,070
All types	52,654	1,381,889	1,434,543

Table 45.--Net volume of State and privately owned woodland by ownership class and species in western Colorado, 1983

Species	Ownership class		
	State	Nonindustrial private	Total
	Thousand cubic feet		
Douglas-fir	4	121	125
Ponderosa pine	--	--	--
Aspen	--	--	--
Pinyon/juniper	20,966	576,881	597,847
Woodland hardwoods	1,856	64,197	66,053
All species	22,826	641,199	664,025

Table 46.--Net annual growth of State and privately owned woodland by ownership class and species in western Colorado, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - Thousand cubic feet - - - - - -		
Douglas-fir	4	121	125
Ponderosa pine	--	--	--
Aspen	--	--	--
Pinyon/juniper	128	4,766	4,894
Woodland hardwoods	107	3,737	3,844
All species	239	8,624	8,863

Table 47.--Annual mortality of State and privately owned woodland by ownership class and species in western Colorado, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - Thousand cubic feet - - - - - -		
Douglas-fir	--	--	--
Ponderosa pine	--	--	--
Aspen	--	--	--
Pinyon/juniper	115	1,474	1,589
Woodland hardwoods	6	221	227
All species	121	1,695	1,816

Table 48.--Area of State and privately owned timberland by county and ownership class in western Colorado, 1983

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - - - - Acres - - - - - - - - - - - -		
Archuleta	1,920	154,214	156,134
Delta	371	25,549	25,920
Dolores	3,009	29,669	32,678
Garfield	--	135,615	135,615
La Plata	5,615	103,627	109,242
Mesa	784	65,748	66,532
Moffat	4,235	34,768	39,003
Montezuma	618	30,090	30,708
Montrose	946	37,276	38,222
Ouray	279	52,425	52,704
Rio Blanco	8,614	53,295	61,909
San Miguel	1,423	60,999	62,422
Total	27,814	783,275	811,089

Table 49.--Net volume of growing stock on State and privately owned timberland by county and ownership class in western Colorado, 1983

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Archuleta	2,868	212,834	215,702
Delta	369	33,176	33,545
Dolores	4,313	40,968	45,281
Garfield	--	187,887	187,887
La Plata	8,137	142,883	151,020
Mesa	1,187	82,723	83,910
Moffat	5,302	40,822	46,124
Montezuma	873	39,022	39,895
Montrose	1,285	49,485	50,770
Ouray	320	74,128	74,448
Rio Blanco	12,216	68,435	80,651
San Miguel	1,963	85,610	87,573
Total	38,833	1,057,973	1,096,806

Table 50.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by county and ownership class in western Colorado, 1983

County	Ownership class		Total
	State	Nonindustrial private	
	- - Thousand board feet International ¼-inch rule - -		
Archuleta	9,874	862,336	872,210
Delta	1,405	101,746	103,151
Dolores	13,631	123,594	137,225
Garfield	--	631,086	631,086
La Plata	35,637	608,639	644,276
Mesa	4,339	242,030	246,369
Moffat	16,951	114,883	131,834
Montezuma	3,698	144,497	148,195
Montrose	4,557	151,894	156,451
Ouray	790	260,004	260,794
Rio Blanco	43,097	211,543	254,640
San Miguel	6,646	277,946	284,592
Total	140,625	3,730,198	3,870,823

Table 51.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by county and ownership class in western Colorado, 1983

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - Thousand board feet, Scribner rule - - - - -		
Archuleta	8,415	740,945	749,360
Delta	1,187	86,744	87,931
Dolores	11,623	105,649	117,272
Garfield	--	539,312	539,312
La Plata	30,648	524,333	554,981
Mesa	3,667	205,491	209,158
Moffat	14,459	97,683	112,142
Montezuma	3,176	124,016	127,192
Montrose	3,922	129,266	133,188
Ouray	670	222,467	223,137
Rio Blanco	36,659	180,431	217,090
San Miguel	5,687	237,188	242,875
Total	120,113	3,193,525	3,313,638

Table 52.--Net annual growth of growing stock on State and privately owned timberland by county and ownership class in western Colorado, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Archuleta	52	4,112	4,164
Delta	12	518	530
Dolores	59	535	594
Garfield	--	3,265	3,265
La Plata	170	2,780	2,950
Mesa	28	1,352	1,380
Moffat	83	607	690
Montezuma	18	678	696
Montrose	22	740	762
Ouray	3	1,259	1,262
Rio Blanco	256	1,074	1,330
San Miguel	32	1,315	1,347
Total	735	18,235	18,970

Table 53.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland by county and ownership class in western Colorado, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - Thousand board feet, International ¼-inch rule - -		
Archuleta	234	19,478	19,712
Delta	134	4,398	4,532
Dolores	478	5,306	5,784
Garfield	--	22,408	22,408
La Plata	910	14,277	15,187
Mesa	99	10,712	10,811
Moffat	472	4,091	4,563
Montezuma	82	4,004	4,086
Montrose	141	5,592	5,733
Ouray	51	7,934	7,985
Rio Blanco	1,121	6,647	7,768
San Miguel	163	9,226	9,389
Total	3,885	114,073	117,958

Table 54.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland by county and ownership class in western Colorado, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - Thousand board feet, Scribner rule - - - - -		
Archuleta	204	17,108	17,312
Delta	109	3,756	3,865
Dolores	416	4,596	5,012
Garfield	--	19,336	19,336
La Plata	789	12,499	13,288
Mesa	86	9,123	9,209
Moffat	410	3,493	3,903
Montezuma	72	3,479	3,551
Montrose	123	4,793	4,916
Ouray	44	6,868	6,912
Rio Blanco	975	5,756	6,731
San Miguel	142	8,015	8,157
Total	3,370	98,822	102,192

Table 55.--Annual mortality of growing stock on State and privately owned timberland by county and ownership class in western Colorado, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Archuleta	18	781	799
Delta	--	273	273
Dolores	37	378	415
Garfield	--	1,219	1,219
La Plata	7	332	339
Mesa	4	706	710
Moffat	40	385	425
Montezuma	2	230	232
Montrose	7	434	441
Ouray	4	453	457
Rio Blanco	58	550	608
San Miguel	15	660	675
Total	192	6,401	6,593

Table 56.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by county and ownership class in western Colorado, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - Thousand board feet, International ¼-inch rule - -		
Archuleta	33	1,634	1,667
Delta	--	314	314
Dolores	38	425	463
Garfield	--	1,529	1,529
La Plata	27	954	981
Mesa	--	631	631
Moffat	47	474	521
Montezuma	4	441	445
Montrose	14	607	621
Ouray	4	722	726
Rio Blanco	38	664	702
San Miguel	37	799	836
Total	242	9,194	9,436

Table 57.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by county and ownership class in western Colorado, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - Thousand board feet, Scribner rule - - - - -		
Archuleta	27	1,383	1,410
Delta	--	260	260
Dolores	32	352	384
Garfield	--	1,257	1,257
La Plata	22	797	819
Mesa	--	527	527
Moffat	39	395	434
Montezuma	3	371	374
Montrose	11	506	517
Ouray	3	596	599
Rio Blanco	31	552	583
San Miguel	31	663	694
Total	199	7,659	7,858

Table 58.--Area of State and privately owned woodland by county and ownership class in western Colorado, 1983

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - - - - - - Acres - - - - - - - - - - - - - -		
Archuleta	485	126,215	126,700
Delta	1,079	54,675	55,754
Dolores	2,354	49,066	51,420
Garfield	1,844	140,619	142,463
La Plata	4,740	204,162	208,902
Mesa	411	130,096	130,507
Moffat	20,531	101,023	121,554
Montezuma	2,462	269,476	271,938
Montrose	2,771	102,929	105,700
Ouray	2,215	56,484	58,699
Rio Blanco	7,988	74,611	82,599
San Miguel	5,774	72,533	78,307
Total	52,654	1,381,889	1,434,543

Table 59.--Net volume of State and privately owned woodland by county and ownership class in western Colorado, 1983

County	Ownership class		Total
	State	Nonindustrial private	
	Thousand cubic feet		
Archuleta	199	68,927	69,126
Delta	495	23,976	24,471
Dolores	574	17,926	18,500
Garfield	805	50,169	50,974
La Plata	1,678	117,143	118,821
Mesa	193	55,765	55,958
Moffat	8,115	32,739	40,854
Montezuma	1,615	157,126	158,741
Montrose	1,772	43,803	45,575
Ouray	1,425	27,126	28,551
Rio Blanco	3,239	21,842	25,081
San Miguel	2,716	24,657	27,373
Total	22,826	641,199	664,025

Table 60.--Net annual growth of State and privately owned woodland by county and ownership class in western Colorado, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	Thousand cubic feet		
Archuleta	4	862	866
Delta	4	358	362
Dolores	15	308	323
Garfield	14	965	979
La Plata	21	1,162	1,183
Mesa	4	926	930
Moffat	58	484	542
Montezuma	14	1,455	1,469
Montrose	14	714	728
Ouray	21	426	447
Rio Blanco	42	470	512
San Miguel	28	494	522
Total	239	8,624	8,863

Table 61.--Annual mortality of State and privately owned woodland by county and ownership class in western Colorado, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Archuleta	([1])	207	207
Delta	2	55	57
Dolores	3	68	71
Garfield	1	152	153
La Plata	10	228	238
Mesa	--	139	139
Moffat	66	218	284
Montezuma	5	246	251
Montrose	6	126	132
Ouray	([1])	42	42
Rio Blanco	16	119	135
San Miguel	12	95	107
Total	121	1,695	1,816

[1]Less than 500 cubic feet.

Angele, Frank E.; Inama, Velma S. 1987. Western Colorado: forest statistics for State and private land, 1983. Resour. Bull. INT-42. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 42 p.

Presents land area, timberland area, woodland area, timber inventory, and growth and mortality data for 12 counties in western Colorado. Information and statistical tables are based on Forest Survey data collected from 1981 through 1984 and cover State and private forest resources.

KEYWORDS: timberland, woodland, growing-stock volume, net annual growth, roundwood harvest, fuelwood harvest

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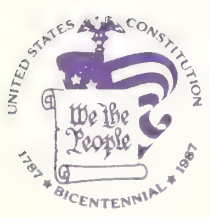

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Resource Bulletin
INT-43

Colorado's Southern Front Range: Forest Statistics for State and Private Land, 1983

Roger C. Conner
William T. Pawley

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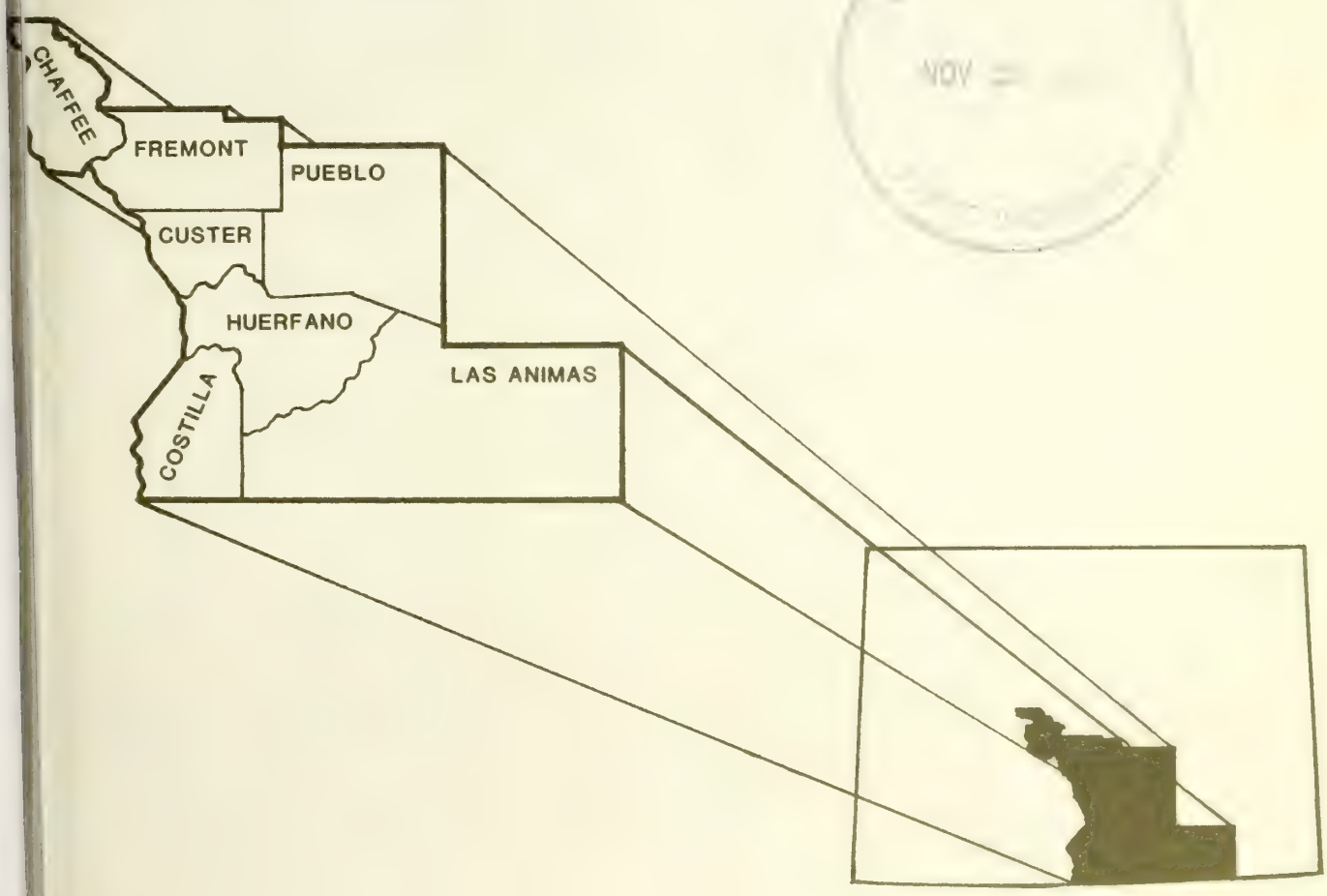

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RESEARCH SUMMARY

Presents land area, timberland area, woodland area, timber inventory, and growth and mortality data for seven counties in Colorado's southern Front Range. Information and statistical tables are based on Forest Survey data collected from 1982 and 1983 and cover State and private resources.

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Colorado's Southern Front Range: Forest Statistics for State and Private Land, 1983

Roger C. Conner
William T. Pawley

INTRODUCTION

This resource bulletin reports the findings of the Forest Survey inventory of a sample area defined as State and private lands in Chaffee, Costilla, Custer, Fremont, Huerfano, Las Animas, and Pueblo Counties of the southern Front Range in Colorado (fig. 1). The two-phase survey began with prefield work in June 1981. The field phase involved, in whole or in part, successive summers from 1981 to 1984 with the bulk of the data collected in 1982.

The data in this report pertain only to the State and private forest resources of the counties listed above. Data for lands administered by various public agencies such as National Forest Systems and Bureau of Land Management will be included in a subsequent, comprehensive statewide report that will include all lands and all owners.

The primary objective of Forest Survey—a continuing, nationwide undertaking of the Forest Service, U.S. Department of Agriculture—is to provide an assessment of the renewable resources for forest and rangelands of the Nation. Fundamental to the accomplishment of the objective are the periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

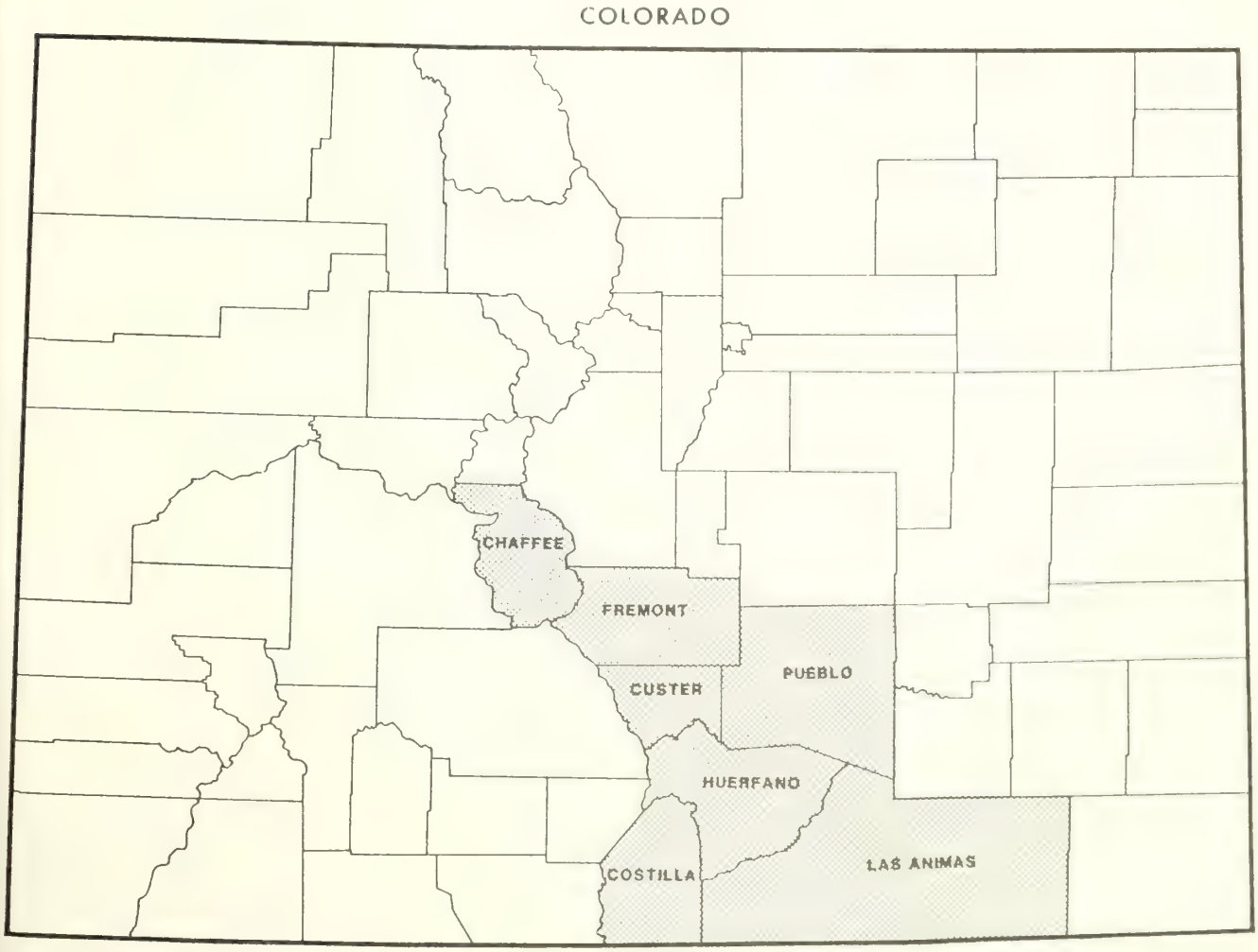

Figure 1—Counties covered by this report.

The Intermountain Research Station with headquarters in Ogden, UT, conducts the forest resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, western South Dakota, Utah, Wyoming, western Texas, and Oklahoma's Panhandle. These inventories provide information on the extent and condition of State and privately owned forest lands and most other lands not in the National Forest System, volume of timber, and rates of timber growth, removals, and mortality.

These data, when combined with similar information on National Forest lands, provide a basis for forming forest policies and programs and for the orderly development and use of the resources.

HIGHLIGHTS

Area

- State and private lands comprise nearly 6.9 million acres, or 81 percent of the total land area in Colorado's southern Front Range (fig. 2).
- Forests occupy over 2 million acres, including reserved land, or 30 percent of the total State and private land area.
- About 47 percent of the forest land, 948,500 acres, is classified nonreserved timberland, and 95 percent of this area is privately owned.
- Approximately 1.1 million acres are classified as nonreserved woodland, 92 percent of which is privately owned.
- Ponderosa pine forest type occurs on 50 percent of the privately owned timberland, while Douglas-fir, spruce, and white fir forest types combined make up 29 percent of the area.
- Nearly 94 percent of the woodland area is occupied by juniper or pinyon-juniper forest types, 92 percent of which is privately owned.

Inventory

- Timberland growing-stock volume is about 1.1 billion cubic feet, and sawtimber volume totals 3.2 billion board feet (International ¼-inch rule).
- Of the timberland growing-stock volume, 28 percent, about 290 million cubic feet, is ponderosa pine, with Engelmann spruce (22 percent), Douglas-fir (21 percent), and lodgepole pine (7 percent) adding another 50 percent.
- Woodland volume amounts to about 338 million cubic feet, 97 percent of which is pinyon and juniper species, and woodland hardwoods the remaining 3 percent.
- Private ownership accounts for 96 percent of the timberland growing-stock volume and 92 percent of the woodland volume.
- Nearly 89 percent of the timberland growing-stock volume is in trees less than 19 inches diameter at breast height (d.b.h.).
- About 81 percent of the sawtimber volume, 2.6 billion board feet (International ¼-inch rule), is in trees less than 19 inches d.b.h.
- Rough, rotten, and salvable dead trees total about 65 million cubic feet, about 6 percent of the timberland sound wood volume.
- About a fifth of the timberland area is capable of producing more than 50 cubic feet of wood per acre per year. However, net annual growth in 1982 was just over 21 cubic feet per acre per year.
- Nearly 65 percent of both the timberland growing-stock and sawtimber volumes are in Las Animas and Costilla Counties.

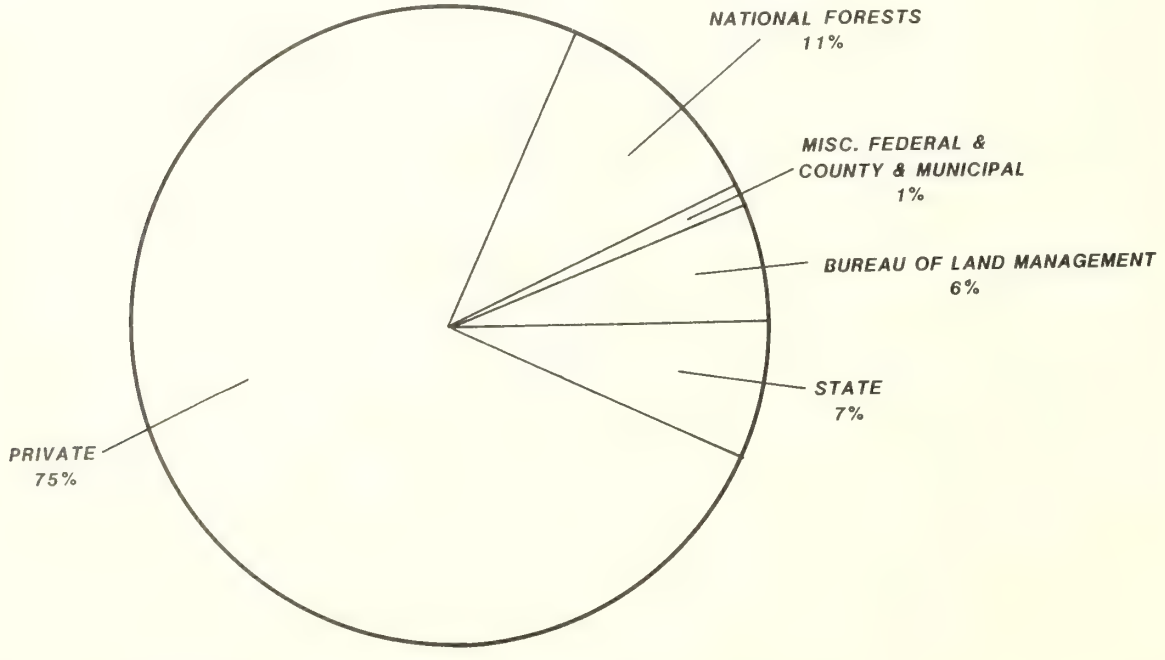

Figure 2—Distribution of land area in Colorado's southern Front Range by owner group.

Components of Change

Growth

- Net annual growth for timberland was over 20.2 million cubic feet in 1982, of which 97 percent was on private land.
- Ponderosa pine and lodgepole pine each account for 25 percent of the timberland net growth, with Engelmann spruce (17 percent) and Douglas-fir (12 percent) adding to the remainder.
- Woodland net annual growth was about 4.6 million cubic feet in 1982, of which 92 percent was on private land.

Mortality

- The annual mortality of 4 million cubic feet of growing stock offsets 17 percent of the timberland gross annual growth.
- Douglas-fir accounts for more than 1 million cubic feet, 26 percent of the timberland annual mortality.
- Weather, insects, and disease caused 68 percent of the mortality.

Removals

- An estimated 1.5 million cubic feet of industrial roundwood material (8.7 million board feet, International ¼-inch rule) was harvested in 1982, of which 56 percent came from State and private land (McLain 1985).
- Custer and Huerfano Counties combined account for 45 percent of the industrial roundwood cubic-foot volume harvested.
- Ponderosa pine contributed the largest percentage to the total board-foot (International ¼-inch rule) harvest (56 percent), with Douglas-fir (23 percent) and spruce (15 percent) accounting for most of the remaining percentage (includes all land owners in the sample area).
- Sawlogs accounted for nearly 100 percent of the industrial roundwood volume harvested (includes all land owners in the sample area).
- Total fuelwood harvest was about 28,500 cords (2.3 million cubic feet) in 1982, of which about 84 percent was cut from State and private land. This was 1.5 times the industrial roundwood harvest (McLain 1985).
- Of the fuelwood, 59 percent was harvested from Pueblo County, and nearly 75 percent of this volume was taken from private land (McLain and Booth 1985).
- Cottonwood accounted for 64 percent of the total fuelwood harvest, with lodgepole pine (20 percent) and pinyon (15 percent) making up most of the remaining percentage (McLain and Booth 1985) (includes all land owners in the sample area).
- Over 99 percent of fuelwood harvested (23,700 cords) from State and private land was from dead trees (McLain and Booth 1985).

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics at the State and sample area levels.

Prefield

Primary area estimates were based on the classification of 34,355 sample points systematically placed on the latest aerial photographs available. The photo points, adjusted to meet known land areas, were used to stratify and compute area expansion factors for the field sample data.

Field

Land classification and estimates for timber characteristics and volume were based on observations or measurements or both recorded at 829 ground sample locations, of which 281 were forested. Sample trees were selected using a 5-point sample cluster, which included 1/300-acre fixed radius plots for trees less than 5 inches d.b.h., and 40 basal area factor variable radius plots for trees 5 inches d.b.h. or larger.

Compilation

All photo and field data were loaded onto tape and stored for computer editing, computation, and tabulation. Final estimates from these data were based on statistical summaries, a portion of which is included in this bulletin. Volume and defect were computed using equations developed by Edminster and others (1980, 1981), Kemp (1958), Chojnacky (1985), Meyers (1964), and Meyers and others (1972).

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on small sample sizes resulting in high sampling errors. The standard error percentages shown in tables 1 and 2 were calculated at the 67 percent confidence level.

TERMINOLOGY AND DATA TABLES

The following section contains definitions that are relevant to the timber resource data in this bulletin. Forest area and timber resource data for Colorado's southern Front Range are displayed in tables 3 through 61.

TERMINOLOGY

Acceptable trees—Growing-stock trees meeting specified standards of size and quality, but not qualifying as desirable trees.

Area condition class—A classification of timberland reflecting the degree to which the site is being utilized by growing-stock trees and other conditions affecting current and prospective timber growth (see Stocking):

Class 10—Areas fully stocked with desirable trees and not overstocked.

Class 20—Areas fully stocked with desirable trees but overstocked with all live trees.

Class 30—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees, or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees, or both.

Class 40—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees, or conditions that ordinarily prevent occupancy by desirable trees, or both.
Class 50—Areas poorly stocked with desirable trees but fully stocked with growing-stock trees.
Class 60—Areas poorly stocked with desirable trees but with medium to full stocking of growing-stock trees.
Class 70—Areas nonstocked or poorly stocked with desirable trees and poorly stocked with growing-stock trees.
Class 80—Low-risk old-growth stands.
Class 90—High-risk old-growth stands.
Nonstocked—Areas less than 10 percent stocked with growing-stock trees.

Basal area—The cross-sectional area of a tree expressed in square feet. For timber species the calculation is based on diameter at breast height (d.b.h.); for woodland species it is based on diameter at root collar (d.r.c.).

Cord—A pile of stacked wood equivalent to 128 cubic feet of wood and air space having standard dimensions of 4 by 4 by 8 feet.

Cull trees—Live trees that are unmerchantable now or prospectively (see Rough trees and Rotten trees).

Cull volume—Portions of a tree's volume that are not usable for wood products because of rot, form, missing material, or other cubic-foot defect. Form and sound defects include severe sweep and crook, forks, extreme form reduction, large deformities, and dead material.

Deferred forest land—Forest lands within the National Forest System that are under study for possible inclusion in the Wilderness System.

Desirable trees—Growing-stock trees (1) having no serious defect in quality to limit present or prospective use for timber products, (2) of relatively high vigor, and (3) containing no pathogens that may result in death or serious deterioration within the next decade.

Diameter at breast height (d.b.h.)—Diameter of the stem measured at 4.5 feet above the ground.

Diameter at root collar (d.r.c.)—Diameter equivalent at the point nearest the ground line that represents the basal area of the tree stem or stems.

Diameter classes—Tree diameters, either d.b.h. or d.r.c., grouped into 2-inch classes labeled by the midpoint of the class.

Farmer-owned lands—Lands owned by a person who operates a farm and who either does the work or directly supervises the work.

Forest industry lands—Lands owned by companies or individuals operating a primary wood-processing plant.

Forest land—Land at least 10 percent stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.

Forest trees—Woody plants having a well-developed stem or stems, usually more than 12 feet in height at maturity, with a generally well-defined crown.

Forest type—A classification of forest land based upon and named for the tree species presently forming a plurality of live-tree stocking.

Growing-stock trees—Live sawtimber trees, poletimber trees, saplings, and seedlings of timber species meeting specified standards of quality and vigor; excludes cull trees.

Growing-stock volume—Net cubic-foot volume in live growing-stock trees from a 1-foot stump to a minimum 4-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.

Growth—See definition for Net annual growth.

Hardwood trees—Dicotyledonous trees, usually broad-leaved and deciduous.

High-risk old-growth stands—Timber stands over 100 years old in which the majority of the trees are not expected to survive more than 10 years.

Indian lands—Indian lands held in trust by the Federal Government.

Industrial wood—All commercial roundwood products except fuelwood.

Land area—The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains, streams, sloughs, estuaries, and canals less than 120 feet wide; and lakes, reservoirs, and ponds less than 1 acre in size.

Logging residues—The unused portions of growing-stock trees cut or killed by logging.

Low-risk old-growth stands—Timber stands over 100 years old in which the majority of the trees are expected to survive more than 10 years.

Miscellaneous Federal lands—Lands administered by Federal agencies other than the Forest Service, U.S. Department of Agriculture, or Bureau of Land Management, U.S. Department of the Interior.

Mortality—The net volume of growing-stock trees that have died from natural causes during a specified period.

National Forest lands—Public lands administered by the Forest Service, U.S. Department of Agriculture.

National Resource lands—Public lands administered by the Bureau of Land Management, U.S. Department of the Interior.

Net annual growth—The net average annual increase in the volume of trees during a specified period.

Net volume in board feet—The gross board-foot volume in the sawlog portion of growing-stock trees, less deductions for cull volume.

Net volume in cubic feet—Gross cubic-foot volume in the merchantable portion of trees less deductions for cull volume. For timber species, volume is computed for the merchantable stem from a 1-foot stump to a minimum 4-inch top diameter outside bark, or to the point where the central stem breaks into limbs. For woodland species, volume is computed outside bark (o.b.) for all

woody material above d.r.c. that is larger than 1.5 inches in diameter (o.b.).

Nonforest land—Land that does not currently qualify as forest land.

Nonindustrial private—All private ownerships except forest industry.

Nonstocked areas—Forest land less than 10 percent stocked with live trees.

Old-growth stands—Stands of timber species over 100 years old.

Other private land—Privately owned land other than forest industry or farmer-owned.

Other public land—Public land administered by agencies other than the Forest Service, U.S. Department of Agriculture.

Other removals—The net volume of growing-stock trees removed from the inventory by cultural operations such as timber-stand improvement, by land clearing, and by changes in land use such as a shift to wilderness.

Poletimber stands—Stands at least 10 percent stocked with growing-stock trees, in which half or more of the stocking is sawtimber or poletimber trees or both, with poletimber stocking exceeding that of sawtimber (see definition for Stocking).

Poletimber trees—Live trees of timber species at least 5 inches d.b.h. but smaller than sawtimber size.

Potential growth—The average net annual cubic-foot growth per acre at culmination of mean annual growth attainable in fully stocked natural stands.

Primary wood-processing plants—Plants using roundwood products such as sawlogs, pulpwood bolts, veneer logs, etc.

Productivity class—A classification of forest land in terms of potential growth.

Removals—The net volume of growing-stock trees removed from the inventory by harvesting, cultural operations, land clearings, or changes in land use.

Reserved forest land—Forest land withdrawn from tree utilization through statute or administrative designation.

Residues:

Coarse residues—Plant residues suitable for chipping, such as slabs, edgings, and ends.

Fine residues—Plant residues not suitable for chipping, such as sawdust, shavings, and veneer clippings.

Plant residues—Wood materials from primary manufacturing plants that are not used for any product.

Rotten tree—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot) and with more than half of the cull volume attributable to rotten or missing material.

Rough tree—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot) and with less than half of the cull volume attributable to rotten or missing material.

Roundwood—Logs, bolts, or other round sections cut from trees.

Salvable dead trees—Standing or down dead trees that are currently merchantable by regional standards.

Saplings—Live trees of timber species 1 to 4.9 inches d.b.h., or woodland species 1 to 2.9 inches d.r.c.

Sapling and seedling stands—Timberland stands at least 10 percent stocked on which more than half of the stocking is saplings or seedlings or both.

Sawlog portion—That part of the bole of sawtimber trees between a 1-foot stump and the sawlog top.

Sawlog top—The point on the bole of sawtimber trees above which a sawlog cannot be produced. The minimum sawlog top is 7 inches diameter o.b. for softwoods, and 9 inches diameter o.b. for hardwoods.

Sawtimber stands—Stands at least 10 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber trees—Live trees of timber species meeting regional size and defect specifications. Softwood trees must be at least 9 inches d.b.h. and hardwood trees 11 inches d.b.h.

Sawtimber volume—Net volume in board feet of the sawlog portion of live sawtimber trees.

Seedlings—Established live trees of timber species less than 1 inch d.b.h. or woodland species less than 1 inch d.r.c.

Softwood trees—Monocotyledonous trees, usually evergreen, having needle or scalelike leaves.

Standard error—An expression of the degree of confidence that can be placed on an estimated total or average obtained by statistical sampling methods. Standard errors do not include technique errors that could occur in photo classification of areas, field measurements, or compilation of data.

Stand-size classes—A classification of forest land based on the predominant size of trees present (see Sawtimber stands, Poletimber stands, and Sapling and seedling stands).

State, county, and municipal lands—Lands administered by States, counties, or local public agencies, or lands leased by these governmental units for more than 50 years.

Stocking—An expression of the extent to which growing space is effectively utilized by present or potential growing-stock trees of timber species. Percentage stocking is the ratio of actual stocking to full stocking for comparable sites and stands, using basal area as the basis for comparison.

Timberland—Forest land where timber species make up at least 10 percent stocking.

Timber species—Tree species traditionally used for industrial wood products. In the Rocky Mountain States, these include aspen and cottonwood hardwood species and all softwood species except pinyon and juniper.

Timber stand improvement—Treatments such as thinning, pruning, release cutting, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.

Upper-stem portion—That part of the main stem or fork of sawtimber trees above the sawlog top to a minimum top diameter of 4 inches o.b. or to the point where the main stem or fork breaks into limbs.

Water—Streams, sloughs, estuaries, and canals more than 120 feet wide, and lakes, reservoirs, and ponds more than 1 acre in size at mean high water level.

Wilderness—An area of undeveloped land currently included in the Wilderness System, managed so as to preserve its natural conditions and retain its primeval character and influence.

Woodland—Forest land where timber species make up less than 10 percent stocking.

Woodland species dead volume—Net volume of dead woodland trees and dead net volume portion of live woodland tree species.

Woodland species live volume—Net cubic-foot volume in live woodland tree species.

Woodland species—Tree species not usually converted into industrial wood products. Common uses are fuelwood, fenceposts, and Christmas trees.

REFERENCES

Chojnacky, David C. 1985. Pinyon-juniper volume equations for the central Rocky Mountain States. Res. Pap. INT-339. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 27 p.

Edminster, Carleton B.; Beeson, Robert T.; Metcalf, Gary E. 1980. Volume tables and point-sampling factors for ponderosa pine in the Front Range of Colorado. Res. Pap. RM-218. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 14 p.

Edminster, Carleton B.; Mowrer, H. Todd; Hinds, Thomas E. 1981. Volume tables and point-sampling factors for aspen in Colorado. Res. Pap. RM-232. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.

Kemp, Paul D. 1958. Volume tables. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Ogden, UT.

McLain, William H. 1985. Colorado's industrial roundwood production and mill residues, 1982. Resour. Bull. INT-35. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 13 p.

McLain, William H.; Booth, Gordon D. 1985. Colorado's 1982 fuelwood harvest. Resour. Bull. INT-36. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 11 p.

Meyers, Clifford A. 1964. Volume tables and point-sampling factors for lodgepole pine in Colorado and Wyoming. Res. Pap. RM-6. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.

Meyers, Clifford A.; Edminster, Carleton B. 1972. Volume tables and point-sampling factors for Engelmann spruce in Colorado and Wyoming. Res. Pap. RM-95. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 23 p.

FOREST SURVEY TABLES

Table 1.-- Area of State and privately owned forest land with percent standard error in Colorado's southern Front Range, 1983

Item	Softwoods		Hardwoods		All types	
	Acres	Percent standard error	Acres	Percent standard error	Acres	Percent standard error
Timberland	848,838	±6.4	99,624	±23.5	948,462	±5.6
Woodland	1,003,191	±6.3	69,126	±40.7	1,072,317	±6.3
Reserved forest land:[1]						
Timberland	--		500		500	
Woodland	2,900		31		2,931	
Total forest land	1,854,929		169,281		2,024,210	

[1]Reserved land areas are estimated from aerial photos without field verification; therefore, standard errors are not calculated.

Table 2.--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on State and privately owned timberland with percent standard error in Colorado's southern Front Range

Item	Softwoods		Hardwoods		All species	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume, 1983:						
Growing stock (M cubic feet)	958,829	± 9.9	97,606	±23.5	1,056,435	± 9.1
Sawtimber[1] (M board feet)	3,098,649	±12.1	119,581	±30.6	3,218,230	±11.7
Sawtimber[2] (M board feet)	2,618,818	±12.1	102,426	±30.8	2,721,244	±11.7
Net annual growth, 1982:						
Growing stock (M cubic feet)	17,828	±16.8	2,390	±37.7	20,218	±15.3
Sawtimber[1] (M board feet)	60,237	±19.7	10,226	±64.4	70,463	±18.3
Sawtimber[2] (M board feet)	50,080	±19.7	8,828	±64.3	58,908	±18.5
Annual mortality, 1982:						
Growing stock (M cubic feet)	3,408	±29.5	594	±75.7	4,002	±27.7
Sawtimber[1] (M board feet)	11,624	±33.8	1,463	±70.0	13,087	±32.1
Sawtimber[2] (M board feet)	10,010	±33.5	1,257	±70.0	11,267	±31.9

[1]International ¼-inch rule.

[2]Scribner rule.

Table 3.--Total land and water area by ownership class in Colorado's southern Front Range, 1983

Ownership class	Area
	- - Acres - -
Land:	
Public:	
National Forest	964,032
Other:	
Bureau of Land Management	531,364
Miscellaneous federal	79,085
State	533,360
County and municipal	49,113
Total other public	1,192,922
Total public	2,156,954
Private	6,319,058
Total land area	8,476,012
Census water	27,046
Total land and water[1]	8,503,058

[1]U.S. Bureau of the Census, land and water area of the United States, 1980.

Table 4.--Total land area on State and privately owned land by major land class and ownership class in Colorado's southern Front Range, 1983

Land class	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - - - - Acres - - - - - - - - - - - -		
Timberland:			
Reserved	500	--	500
Nonreserved	42,811	905,651	948,462
Total	43,311	905,651	948,962
Woodland:			
Reserved	2,931	--	2,931
Nonreserved	80,755	991,562	1,072,317
Total	83,686	991,562	1,075,248
Total forest land:			
Reserved	3,431	--	3,431
Nonreserved	123,566	1,897,213	2,020,779
Total	126,997	1,897,213	2,024,210
Nonforest land	406,363	4,421,845	4,828,208
Total land area	533,360	6,319,058	6,852,418

Table 5.--Area of forest land on State and privately owned land by forest type, ownership class, and land class in Colorado's southern Front Range, 1983

Forest type	Ownership class and land class						
	State		Nonindustrial private		All owners		
	Reserved	Nonreserved	Reserved	Nonreserved	Reserved	Nonreserved	Total
	Acres						
Douglas-fir	--	6,653	--	119,531	--	126,184	126,184
Ponderosa pine	--	24,561	--	446,341	--	470,902	470,902
Lodgepole pine	--	884	--	36,273	--	37,157	37,157
Limber pine	--	458	--	19,009	--	19,467	19,467
Spruce subalpine-fir	--	1,381	--	43,536	--	44,917	44,917
White fir	--	3,011	--	64,589	--	67,600	67,600
Spruce	--	2,340	--	80,271	--	82,611	82,611
Aspen	--	2,694	--	66,831	--	69,525	69,525
Cottonwood	500	829	--	29,270	500	30,099	30,599
Total timberland	500	42,811	--	905,651	500	948,462	948,962
Pinyon-juniper	2,900	60,471	--	733,108	2,900	793,579	796,479
Juniper	--	18,231	--	191,381	--	209,612	209,612
Oak	31	1,824	--	57,569	31	59,393	59,424
Other west hardwoods	--	229	--	9,504	--	9,733	9,733
Total woodland	2,931	80,755	--	991,562	2,931	1,072,317	1,075,248
Total all types	3,431	123,566	--	1,897,213	3,431	2,020,779	2,024,210

Table 6.--Cubic feet of net volume in trees on State and privately owned forest land by species and ownership class in Colorado's southern Front Range, 1983

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - Thousand cubic feet - - - - - - -		
Douglas-fir	9,634	208,946	218,580
Ponderosa pine	13,560	276,887	290,447
Lodgepole pine	1,345	69,670	71,015
Whitebark pine	598	19,044	19,642
Limber pine	816	21,682	22,498
Subalpine fir	1,474	46,062	47,536
White fir	2,865	56,999	59,864
Engelmann spruce	6,481	222,886	229,367
Aspen	2,347	74,192	76,539
Cottonwood	285	20,782	21,067
Total timberland species	39,405	1,017,150	1,056,555
Pinyon/juniper	28,240	333,617	361,857
Woodland hardwoods	1,308	24,367	25,675
Total woodland species	29,548	357,984	387,532
Total all species	68,953	1,375,134	1,444,087

Table 7.--Cubic feet of net annual growth in trees on State and privately owned forest land by species and ownership class in Colorado's southern Front Range, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - Thousand cubic feet - - - - - - -		
Douglas-fir	139	2,214	2,353
Ponderosa pine	250	4,762	5,012
Lodgepole pine	97	4,879	4,976
Whitebark pine	7	224	231
Limber pine	11	235	246
Subalpine fir	37	1,107	1,144
White fir	-20	374	354
Engelmann spruce	122	3,392	3,514
Aspen	63	1,572	1,635
Cottonwood	3	752	755
Total timberland species	709	19,511	20,220
Pinyon/juniper	391	4,376	4,767
Woodland hardwoods	-4	160	156
Total woodland species	387	4,536	4,923
Total all species	1,096	24,047	25,143

Table 8.--Cubic feet of annual mortality in trees on State and privately owned forest land by species and ownership class in Colorado's southern Front Range, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - Thousand cubic feet - - - - - - -		
Douglas-fir	43	1,000	1,043
Ponderosa pine	25	622	647
Lodgepole pine	--	--	--
Whitebark pine	--	--	--
Limber pine	--	--	--
Subalpine fir	--	--	--
White fir	78	913	991
Engelmann spruce	--	727	727
Aspen	--	594	594
Cottonwood	--	--	--
Total timberland species	146	3,856	4,002
Pinyon/juniper	18	476	494
Woodland hardwoods	34	342	376
Total woodland species	52	818	870
Total all species	198	4,674	4,872

Table 9.--Area of State and privately owned timberland by forest type, stand-size class, and productivity class in Colorado's southern Front Range, 1983

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - Acres - - - - - - - - - - - - -				
Douglas-fir:					
Sawtimber	--	14,448	58,930	--	73,378
Poletimber	--	3,799	45,168	--	48,967
Sapling and seedling	--	--	--	--	--
Nonstocked	--	3,839	--	--	3,839
Total	--	22,086	104,098	--	126,184
Ponderosa pine:					
Sawtimber	--	16,526	254,196	--	270,722
Poletimber	--	12,098	96,418	--	108,516
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	91,664	--	91,664
Total	--	28,624	442,278	--	470,902
Lodgepole pine:					
Sawtimber	--	--	12,976	--	12,976
Poletimber	--	--	24,181	--	24,181
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	37,157	--	37,157
Limber pine:					
Sawtimber	--	--	9,733	9,734	19,467
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	9,733	9,734	19,467
Spruce-subalpine fir:					
Sawtimber	--	8,263	36,654	--	44,917
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	8,263	36,654	--	44,917

(con.)

Table 9. (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - Acres - - - - - - - - - - - -				
White fir:					
Sawtimber	--	13,568	28,625	--	42,193
Poletimber	--	8,553	--	--	8,553
Sapling and seedling	--	9,184	3,835	--	13,019
Nonstocked	3,835	--	--	--	3,835
Total	3,835	31,305	32,460	--	67,600
Spruce:					
Sawtimber	--	51,101	18,283	--	69,384
Poletimber	4,714	--	3,799	--	8,513
Sapling and seedling	--	--	4,714	--	4,714
Nonstocked	--	--	--	--	--
Total	4,714	51,101	26,796	--	82,611
Aspen:					
Sawtimber	--	8,262	9,428	--	17,690
Poletimber	--	14,545	--	--	14,545
Sapling and seedling	--	3,840	10,184	23,266	37,290
Nonstocked	--	--	--	--	--
Total	--	26,647	19,612	23,266	69,525
Cottonwood:					
Sawtimber	--	9,957	10,184	--	20,141
Poletimber	--	9,958	--	--	9,958
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	19,915	10,184	--	30,099
All types:					
Sawtimber	--	122,125	439,009	9,734	570,868
Poletimber	4,714	48,953	169,566	--	223,233
Sapling and seedling	--	13,024	18,733	23,266	55,023
Nonstocked	3,835	3,839	91,664	--	99,338
Total	8,549	187,941	718,972	33,000	948,462

Table 10.--Area of State owned timberland by forest type, stand-size class, and productivity class in Colorado's southern Front Range, 1983

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - Acres - - - - - - - - - - - -				
Douglas-fir:					
Sawtimber	--	229	4,157	--	4,386
Poletimber	--	656	1,611	--	2,267
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	885	5,768	--	6,653
Ponderosa pine:					
Sawtimber	--	853	12,374	--	13,227
Poletimber	--	698	3,770	--	4,468
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	6,866	--	6,866
Total	--	1,551	23,010	--	24,561
Lodgepole pine:					
Sawtimber	--	--	426	--	426
Poletimber	--	--	458	--	458
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	884	--	884
Limber pine:					
Sawtimber	--	--	229	229	458
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	229	229	458
Spruce-subalpine fir:					
Sawtimber	--	426	955	--	1,381
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	426	955	--	1,381

(con.)

Table 10. (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - Acres - - - - - - - - - - - -				
White fir:					
Sawtimber	--	500	1,551	--	2,051
Poletimber	--	--	--	--	--
Sapling and seedling	--	418	271	--	689
Nonstocked	271	--	--	--	271
Total	271	918	1,822	--	3,011
Spruce:					
Sawtimber	--	1,183	501	--	1,684
Poletimber	--	--	656	--	656
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	1,183	1,157	--	2,340
Aspen:					
Sawtimber	--	426	--	--	426
Poletimber	--	325	--	--	325
Sapling and seedling	--	--	829	1,114	1,943
Nonstocked	--	--	--	--	--
Total	--	751	829	1,114	2,694
Cottonwood:					
Sawtimber	--	--	829	--	829
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	829	--	829
All types:					
Sawtimber	--	3,617	21,022	229	24,868
Poletimber	--	1,679	6,495	--	8,174
Sapling and seedling	--	418	1,100	1,114	2,632
Nonstocked	271	--	6,866	--	7,137
Total	271	5,714	35,483	1,343	42,811

Table 11.--Area of nonindustrial privately owned timberland by forest type, stand-size class, and productivity class in Colorado's southern Front Range, 1983

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - Acres - - - - - - - - - - - -				
Douglas-fir:					
Sawtimber	--	14,219	54,773	--	68,992
Poletimber	--	3,143	43,557	--	46,700
Sapling and seedling	--	--	--	--	--
Nonstocked	--	3,839	--	--	3,839
Total	--	21,201	98,330	--	119,531
Ponderosa pine:					
Sawtimber	--	15,673	241,822	--	257,495
Poletimber	--	11,400	92,648	--	104,048
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	84,798	--	84,798
Total	--	27,073	419,268	--	446,341
Lodgepole pine:					
Sawtimber	--	--	12,550	--	12,550
Poletimber	--	--	23,723	--	23,723
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	36,273	--	36,273
Limber pine:					
Sawtimber	--	--	9,504	9,505	19,009
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	9,504	9,505	19,009
Spruce-subalpine fir:					
Sawtimber	--	7,837	35,699	--	43,536
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	7,837	35,699	--	43,536

(con.)

Table 11. (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - Acres - - - - - - - - - - - -				
White fir:					
Sawtimber	--	13,068	27,074	--	40,142
Poletimber	--	8,553	--	--	8,553
Sapling and seedling	--	8,766	3,564	--	12,330
Nonstocked	3,564	--	--	--	3,564
Total	3,564	30,387	30,638	--	64,589
Spruce:					
Sawtimber	--	49,918	17,782	--	67,700
Poletimber	4,714	--	3,143	--	7,857
Sapling and seedling	--	--	4,714	--	4,714
Nonstocked	--	--	--	--	--
Total	4,714	49,918	25,639	--	80,271
Aspen:					
Sawtimber	--	7,836	9,428	--	17,264
Poletimber	--	14,220	--	--	14,220
Sapling and seedling	--	3,840	9,355	22,152	35,347
Nonstocked	--	--	--	--	--
Total	--	25,896	18,783	22,152	66,831
Cottonwood:					
Sawtimber	--	9,957	9,355	--	19,312
Poletimber	--	9,958	--	--	9,958
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	19,915	9,355	--	29,270
All types:					
Sawtimber	--	118,508	417,987	9,505	546,000
Poletimber	4,714	47,274	163,071	--	215,059
Sapling and seedling	--	12,606	17,633	22,152	52,391
Nonstocked	3,564	3,839	84,798	--	92,201
Total	8,278	182,227	683,489	31,657	905,651

Table 12.--Area of State and privately owned timberland by stand volume and ownership class in Colorado's southern Front Range, 1983

Stand volume per acre[1]	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - - - Acres - - - - - - - - - - -		
Less than 1,500 board feet	19,183	354,655	373,838
1,500 to 4,999 board feet	14,820	319,493	334,313
5,000 to 9,999 board feet	7,310	165,107	172,417
10,000 board feet or more	1,498	66,396	67,894
All classes	42,811	905,651	948,462

[1]International ¼-inch rule.

Table 13.--Area of State and privately owned timberland by forest type and area condition class in Colorado's southern Front Range, 1983

Forest type	Area condition class										
	10	20	30	40	50	60	70	80	90	Nonstocked	All classes
	- - - - - - - - - - -

Table 14.--Number of growing-stock trees on State and privately owned timberland by species and diameter class in Colorado's southern Front Range, 1983

Species	Diameter class (inches at breast height)															
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand trees															
Douglas-fir	1,040	9,416	7,590	7,022	2,368	1,547	1,501	1,266	495	255	245	79	49	9	18	32,900
Ponderosa pine	3,202	15,071	15,417	13,763	6,770	2,985	2,447	840	921	331	118	37	73	18	29	62,022
Lodgepole pine	1,445	9,583	13,995	3,144	779	333	184	--	--	--	--	--	--	--	--	29,463
Whitebark pine	--	--	864	760	351	282	227	154	46	17	--	--	--	--	--	2,701
Limber pine	--	3,467	1,099	170	274	517	103	54	48	74	11	--	10	18	8	5,853
Subalpine fir	2,065	3,933	4,503	2,886	1,385	143	--	22	23	--	--	--	--	--	--	14,960
White fir	7,266	3,460	6,173	2,578	1,363	789	229	261	59	70	64	--	--	16	6	22,334
Engelmann spruce	18,300	8,089	5,013	6,126	2,934	3,566	1,440	871	529	176	70	25	58	--	--	47,197
Total softwoods	33,318	53,019	54,654	36,449	16,224	10,162	6,131	3,468	2,121	923	508	141	190	61	61	217,430
Aspen	33,419	19,627	13,641	4,371	1,391	587	214	102	--	--	--	--	--	--	--	73,352
Cottonwood	--	--	1,435	685	884	107	--	59	45	--	--	--	--	--	63	3,278
Total hardwoods	33,419	19,627	15,076	5,056	2,275	694	214	161	45	--	--	--	--	--	63	76,630
All species	66,737	72,646	69,730	41,505	18,499	10,856	6,345	3,629	2,166	923	508	141	190	61	124	294,060

Table 15.--Number of cull and salvable dead trees on State and privately owned timberland by ownership class, and softwoods and hardwoods in Colorado's southern Front Range, 1983

Ownership class and species group	Cull trees			Salvable dead trees	All dead trees
	Sound	Rotten	Total		
	- - - - - - - - - - Thousand trees - - - - - - - - - -				
State:					
Softwoods	62	47	109	459	568
Hardwoods	--	17	17	171	188
Total	62	64	126	630	756
Nonindustrial private:					
Softwoods	1,134	1,040	2,174	9,194	11,368
Hardwoods	--	590	590	4,137	4,727
Total	1,134	1,630	2,764	13,331	16,095
Total:					
Softwoods	1,196	1,087	2,283	9,653	11,936
Hardwoods	--	607	607	4,308	4,915
Total	1,196	1,694	2,890	13,961	16,851

Table 16.--Net volume of growing stock on State and privately owned timberland by ownership class, forest type, and stand-size class in Colorado's southern Front Range, 1983

Ownership class	Forest type	Stand-size class				
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	All classes
		Thousand cubic feet				
State:						
	Douglas-fir	7,010	3,336	--	--	10,346
	Ponderosa pine	9,895	3,449	--	483	13,827
	Lodgepole pine	602	736	--	--	1,338
	Limber pine	387	--	--	--	387
	Spruce-subalpine fir	3,340	--	--	--	3,340
	White fir	2,217	--	218	--	2,435
	Spruce	4,541	892	--	--	5,433
	Aspen	823	735	345	--	1,903
	Cottonwood	387	--	--	--	387
	All types	29,202	9,148	563	483	39,396
Nonindustrial private:						
	Douglas-fir	136,903	64,855	--	386	202,144
	Ponderosa pine	203,776	77,344	--	6,736	287,856
	Lodgepole pine	29,466	44,876	--	--	74,342
	Limber pine	16,073	--	--	--	16,073
	Spruce-subalpine fir	103,542	--	--	--	103,542
	White fir	43,914	13,027	5,269	--	62,210
	Spruce	178,484	9,144	750	--	188,378
	Aspen	25,130	30,047	5,378	--	60,555
	Cottonwood	8,708	13,231	--	--	21,939
	All types	745,996	252,524	11,397	7,122	1,017,039
Total:						
	Douglas-fir	143,913	68,191	--	386	212,490
	Ponderosa pine	213,671	80,793	--	7,219	301,683
	Lodgepole pine	30,068	45,612	--	--	75,680
	Limber pine	16,460	--	--	--	16,460
	Spruce-subalpine fir	106,882	--	--	--	106,882
	White fir	46,131	13,027	5,487	--	64,645
	Spruce	183,025	10,036	750	--	193,811
	Aspen	25,953	30,782	5,723	--	62,458
	Cottonwood	9,095	13,231	--	--	22,326
	All types	775,198	261,672	11,960	7,605	1,056,435

Table 17.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class, forest type, and stand-size class in Colorado's southern Front Range, 1983

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
		- - - - - Thousand board feet, International ¼-inch rule - - - -				
State:						
	Douglas-fir	23,715	8,699	--	--	32,414
	Ponderosa pine	36,415	5,879	--	2,215	44,509
	Lodgepole pine	1,503	131	--	--	1,634
	Limber pine	1,183	--	--	--	1,183
	Spruce-subalpine fir	10,127	--	--	--	10,127
	White fir	8,113	--	902	--	9,015
	Spruce	17,693	648	--	--	18,341
	Aspen	2,334	992	371	--	3,697
	Cottonwood	1,811	--	--	--	1,811
	All types	102,894	16,349	1,273	2,215	122,731
Nonindustrial private:						
	Douglas-fir	505,199	165,425	--	1,270	671,894
	Ponderosa pine	724,110	127,445	--	31,914	883,469
	Lodgepole pine	79,350	5,417	--	--	84,767
	Limber pine	49,126	--	--	--	49,126
	Spruce-subalpine fir	325,685	--	--	--	325,685
	White fir	151,226	17,720	19,031	--	187,977
	Spruce	696,720	9,476	2,052	--	708,248
	Aspen	77,614	47,485	11,633	--	136,732
	Cottonwood	40,730	6,871	--	--	47,601
	All types	2,649,760	379,839	32,716	33,184	3,095,499
Total:						
	Douglas-fir	528,914	174,124	--	1,270	704,308
	Ponderosa pine	760,525	133,324	--	34,129	927,978
	Lodgepole pine	80,853	5,548	--	--	86,401
	Limber pine	50,309	--	--	--	50,309
	Spruce-subalpine fir	335,812	--	--	--	335,812
	White fir	159,339	17,720	19,933	--	196,992
	Spruce	714,413	10,124	2,052	--	726,589
	Aspen	79,948	48,477	12,004	--	140,429
	Cottonwood	42,541	6,871	--	--	49,412
	All types	2,752,654	396,188	33,989	35,399	3,218,230

Table 18.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by ownership class, forest type, and stand-size class in Colorado's southern Front Range, 1983

Ownership class	Forest type	Stand-size class				
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	All classes
		- - - - - - - Thousand board feet, Scribner rule - - - - - - -				
State:						
	Douglas-fir	20,040	7,343	--	--	27,383
	Ponderosa pine	30,741	4,810	--	1,880	37,431
	Lodgepole pine	1,298	116	--	--	1,414
	Limber pine	1,005	--	--	--	1,005
	Spruce-subalpine fir	8,623	--	--	--	8,623
	White fir	6,913	--	772	--	7,685
	Spruce	14,902	577	--	--	15,479
	Aspen	1,996	841	324	--	3,161
	Cottonwood	1,600	--	--	--	1,600
	All types	87,118	13,687	1,096	1,880	103,781
Nonindustrial private:						
	Douglas-fir	428,550	139,850	--	1,131	569,531
	Ponderosa pine	611,285	103,879	--	27,376	742,540
	Lodgepole pine	67,823	4,821	--	--	72,644
	Limber pine	41,772	--	--	--	41,772
	Spruce-subalpine fir	277,221	--	--	--	277,221
	White fir	129,127	14,876	16,135	--	160,138
	Spruce	585,568	8,111	1,826	--	595,505
	Aspen	66,809	40,084	9,998	--	116,891
	Cottonwood	35,710	5,511	--	--	41,221
	All types	2,243,865	317,132	27,959	28,507	2,617,463
Total:						
	Douglas-fir	448,590	147,193	--	1,131	596,914
	Ponderosa pine	642,026	108,689	--	29,256	779,971
	Lodgepole pine	69,121	4,937	--	--	74,058
	Limber pine	42,777	--	--	--	42,777
	Spruce-subalpine fir	285,844	--	--	--	285,844
	White fir	136,040	14,876	16,907	--	167,823
	Spruce	600,470	8,688	1,826	--	610,984
	Aspen	68,805	40,925	10,322	--	120,052
	Cottonwood	37,310	5,511	--	--	42,821
	All types	2,330,983	330,819	29,055	30,387	2,721,244

Table 19.--Net volume of growing stock on State and privately owned timberland by ownership class and species in Colorado's southern Front Range, 1983

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Douglas-fir	9,634	208,946	218,580
Ponderosa pine	13,551	276,775	290,326
Lodgepole pine	1,345	69,670	71,015
Whitebark pine	598	19,045	19,643
Limber pine	816	21,682	22,498
Subalpine fir	1,474	46,062	47,536
White fir	2,865	56,999	59,864
Engelmann spruce	6,481	222,886	229,367
Total softwoods	36,764	922,065	958,829
Aspen	2,347	74,192	76,539
Cottonwood	285	20,782	21,067
Total hardwoods	2,632	94,974	97,606
All species	39,396	1,017,039	1,056,435

Table 20.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class and species in Colorado's southern Front Range, 1983

Species	Ownership class		
	State	Nonindustrial private	Total
	- - Thousand board feet, International ¼-inch rule - -		
Douglas-fir	35,831	808,524	844,355
Ponderosa pine	44,451	886,774	931,225
Lodgepole pine	1,197	67,467	68,664
Whitebark pine	1,580	63,013	64,593
Limber pine	2,365	84,077	86,442
Subalpine fir	2,160	78,992	81,152
White fir	9,404	160,253	169,657
Engelmann spruce	22,238	830,323	852,561
Total softwoods	119,226	2,979,423	3,098,649
Aspen	2,206	74,258	76,464
Cottonwood	1,299	41,818	43,117
Total hardwoods	3,505	116,076	119,581
All species	122,731	3,095,499	3,218,230

Table 21.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by ownership class and species in Colorado's southern Front Range, 1983

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - Thousand board feet, Scribner rule - - - - -		
Douglas-fir	30,182	683,209	713,391
Ponderosa pine	37,520	748,127	785,647
Lodgepole pine	1,057	57,974	59,031
Whitebark pine	1,320	52,879	54,199
Limber pine	2,020	72,142	74,162
Subalpine fir	1,874	67,884	69,758
White fir	7,997	136,161	144,158
Engelmann spruce	18,781	699,691	718,472
Total softwoods	100,751	2,518,067	2,618,818
Aspen	1,875	63,190	65,065
Cottonwood	1,155	36,206	37,361
Total hardwoods	3,030	99,396	102,426
All species	103,781	2,617,463	2,721,244

Table 22.--Net volume of growing stock on State and privately owned timberland by species and diameter class in Colorado's southern Front Range, 1983

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand cubic feet													
Douglas-fir	14,272	32,030	20,302	22,873	32,923	35,039	18,535	14,655	15,517	5,724	3,560	859	2,291	218,580
Ponderosa pine	26,049	55,876	48,670	29,790	44,582	23,638	27,942	15,337	6,244	2,334	5,325	1,361	3,178	290,326
Lodgepole pine	35,671	17,448	7,789	5,583	4,524	--	--	--	--	--	--	--	--	71,015
Whitebark pine	1,386	2,497	2,564	3,973	3,796	3,536	1,342	549	--	--	--	--	--	19,643
Limber pine	1,598	831	3,071	7,742	1,918	1,046	1,406	1,928	420	--	861	959	718	22,498
Subalpine fir	15,824	11,393	16,555	2,197	--	745	822	--	--	--	--	--	--	47,536
White fir	8,505	10,644	9,568	10,789	3,974	6,879	1,921	2,637	3,116	--	--	1,097	734	59,864
Engelmann spruce	11,629	31,202	28,040	57,491	32,130	27,246	19,387	9,243	4,454	1,679	6,866	--	--	229,367
Total softwoods	114,934	161,921	136,559	140,438	123,847	98,129	71,355	44,349	29,751	9,737	16,612	4,276	6,921	958,829
Aspen	24,719	22,232	13,756	8,/18	4,210	2,904	--	--	--	--	--	--	--	76,539
Cottonwood	1,443	3,213	7,225	1,350	--	1,055	946	--	--	--	--	--	5,835	21,067
Total hardwoods	26,162	25,445	20,981	10,068	4,210	3,959	946	--	--	--	--	--	5,835	97,606
All species	141,096	187,366	157,540	150,506	128,057	102,088	72,301	44,349	29,751	9,737	16,612	4,276	12,756	1,056,435

Table 23.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by species and diameter class in Colorado's southern Front Range, 1983

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	67,791	103,375	162,248	178,285	97,196	80,540	84,993	31,930	19,776	4,923	13,298	844,355
Ponderosa pine	156,293	117,307	212,379	121,033	143,852	81,605	33,316	12,485	28,514	7,279	17,162	931,225
Lodgepole pine	23,397	23,528	21,739	--	--	--	--	--	--	--	--	68,664
Whitebark pine	7,755	15,643	15,731	16,258	6,518	2,688	--	--	--	--	--	64,593
Limber pine	10,983	31,104	8,243	4,451	6,873	8,987	2,116	--	4,669	5,097	3,919	86,442
Subalpine fir	63,571	9,873	--	3,672	4,036	--	--	--	--	--	--	81,152
White fir	31,209	46,948	17,861	32,223	8,590	11,522	13,364	--	--	4,634	3,306	169,657
Engelmann spruce	92,224	260,530	153,660	134,314	95,178	46,327	22,897	8,776	38,655	--	--	852,561
Total softwoods	453,223	608,308	591,861	490,236	362,243	231,669	156,686	53,191	91,614	21,933	37,685	3,098,649
Aspen	XXXXX	40,992	20,598	14,874	--	--	--	--	--	--	--	76,464
Cottonwood	XXXXX	6,871	--	5,178	4,491	--	--	--	--	--	26,577	43,117
Total hardwoods	XXXXX	47,863	20,598	20,052	4,491	--	--	--	--	--	26,577	119,581
All species	453,223	656,171	612,459	510,288	366,734	231,669	156,686	53,191	91,614	21,933	64,262	3,218,230

Table 24.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by species and diameter class in Colorado's southern Front Range, 1983

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Douglas-fir	60,237	88,906	135,135	146,521	78,906	68,811	73,076	28,141	17,442	4,381	11,835	713,391
Ponderosa pine	118,979	94,585	181,703	105,435	125,617	71,898	29,414	11,048	25,268	6,451	15,249	785,647
Lodgepole pine	20,634	20,064	18,333	--	--	--	--	--	--	--	--	59,031
Whitebark pine	5,933	13,435	13,411	13,724	5,441	2,255	--	--	--	--	--	54,199
Limber pine	9,561	26,644	7,003	3,773	5,773	7,560	1,766	--	4,156	4,438	3,488	74,162
Subalpine fir	55,040	8,455	--	2,990	3,273	--	--	--	--	--	--	69,758
White fir	27,402	40,354	15,097	26,494	6,992	9,331	11,420	--	--	4,125	2,943	144,158
Engelmann spruce	82,003	222,050	127,693	109,717	77,241	37,784	19,874	7,708	34,402	--	--	718,472
Total softwoods	379,789	514,493	498,375	408,654	303,243	197,639	135,550	46,897	81,268	19,395	33,515	2,618,818
Aspen	XXXXX	35,128	17,386	12,551	--	--	--	--	--	--	--	65,065
Cottonwood	XXXXX	5,512	--	4,358	3,838	--	--	--	--	--	23,653	37,361
Total hardwoods	XXXXX	40,640	17,386	16,909	3,838	--	--	--	--	--	23,653	102,426
All species	379,789	555,133	515,761	425,563	307,081	197,639	135,550	46,897	81,268	19,395	57,168	2,721,244

Table 25.--Net volume of timber on State and privately owned timberland by class of timber, and softwoods and hardwoods in Colorado's southern Front Range, 1983

Class of timber	Softwoods	Hardwoods	All classes
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Sawtimber trees:			
Saw-log portion	593,991	19,387	613,378
Upper-stem portion	87,984	5,630	93,614
Total	681,975	25,017	706,992
Poletimber trees	276,854	72,589	349,443
All growing stock trees	958,829	97,606	1,056,435
Sound cull trees	1,769	--	1,769
Rotten cull trees	4,054	1,994	6,048
Salvable dead trees	49,933	7,194	57,127
All timber	1,014,585	106,794	1,121,379

Table 26.--Net volume of growing stock on State and privately owned timberland by forest type and species in Colorado's southern Front Range, 1983

Forest type	Species												
	Douglas-fir	Ponderosa pine	Lodgepole pine	Whitebark pine	Limber pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	Cotton-wood	Total hardwoods	All species
	- Thousand cubic feet -												
Douglas-fir	143,980	11,933	4,625	3,325	10,000	1,130	18,806	11,615	205,414	7,076	--	7,076	212,490
Ponderosa pine	16,774	265,019	--	--	--	--	4,922	--	286,715	14,968	--	14,968	301,683
Lodgepole pine	--	--	66,390	--	--	1,528	--	7,066	74,984	696	--	696	75,680
Limber pine	2,320	--	--	--	7,563	--	2,668	--	12,551	3,909	--	3,909	16,460
Spruce-subalpine fir	19,711	--	--	14,542	4,515	35,533	--	32,581	106,882	--	--	--	106,882
White fir	22,215	7,096	--	--	420	--	27,567	--	57,298	7,347	--	7,347	64,645
Spruce	2,086	--	--	1,143	--	8,600	--	175,695	187,524	6,287	--	6,287	193,811
Aspen	11,494	5,019	--	633	--	745	5,901	2,410	26,202	36,256	--	36,256	62,458
Cottonwood	--	1,259	--	--	--	--	--	--	1,259	--	21,067	21,067	22,326
All types	218,580	290,326	71,015	19,643	22,498	47,536	59,864	229,367	958,829	76,539	21,067	97,606	1,056,435

Table 27.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by forest type and species in Colorado's southern Front Range, 1983

Forest type	Species												
	Douglas-fir	Ponderosa pine	Lodgepole pine	Whitebark pine	Limber pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	Cotton-wood	Total hardwoods	All species
	Thousand board feet, International ¼-inch rule												
Douglas-fir	530,386	45,114	1,867	12,576	36,210	2,774	51,485	23,896	704,308	--	--	--	704,308
Ponderosa pine	69,280	821,858	--	--	--	--	13,428	--	904,566	23,412	--	23,412	927,978
Lodgepole pine	--	--	66,797	--	--	7,099	--	12,505	86,401	--	--	--	86,401
Limber pine	5,635	--	--	--	29,236	--	11,107	--	45,978	4,331	--	4,331	50,309
Spruce-subalpine fir	98,511	--	--	52,017	18,880	50,926	--	115,478	335,812	--	--	--	335,812
White fir	71,516	32,001	--	--	2,116	--	76,946	--	182,579	14,413	--	14,413	196,992
Spruce	11,251	--	--	--	--	16,682	--	691,400	719,333	7,256	--	7,256	726,589
Aspen	57,776	25,957	--	--	--	3,671	16,691	9,282	113,377	27,052	--	27,052	140,429
Cottonwood	--	6,295	--	--	--	--	--	--	6,295	--	43,117	43,117	49,412
All types	844,355	931,225	68,664	64,593	86,442	81,152	169,657	852,561	3,098,649	76,464	43,117	119,581	3,218,230

Table 28.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by forest type and species in Colorado's southern Front Range, 1983

Forest type	Species												
	Douglas-fir	Ponderosa pine	Lodgepole pine	Whitebark pine	Limber pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	Cotton-wood	Total hardwoods	All species
	Thousand board feet, Scribner rule												
Douglas-fir	448,740	38,535	1,473	10,668	31,414	2,451	43,225	20,408	596,914	--	--	--	596,914
Ponderosa pine	57,097	691,361	--	--	--	--	11,534	--	759,992	19,979	--	19,979	779,971
Lodgepole pine	--	--	57,558	--	--	6,004	--	10,496	74,058	--	--	--	74,058
Limber pine	4,873	--	--	--	24,890	--	9,252	--	39,015	3,762	--	3,762	42,777
Spruce-subalpine fir	83,712	--	--	43,531	16,092	43,697	--	98,812	285,844	--	--	--	285,844
White fir	60,542	27,684	--	--	1,766	--	65,639	--	155,631	12,192	--	12,192	167,823
Spruce	9,342	--	--	--	--	14,616	--	580,781	604,739	6,245	--	6,245	610,984
Aspen	49,085	22,607	--	--	--	2,990	14,508	7,975	97,165	22,887	--	22,887	120,052
Cottonwood	--	5,460	--	--	--	--	--	--	5,460	--	37,361	37,361	42,821
All types	713,391	785,647	59,031	54,199	74,162	69,758	144,158	718,472	2,618,818	65,065	37,361	102,426	2,721,244

Table 29.--Net annual growth of growing stock on State and privately owned timberland by ownership class and species in Colorado's southern Front Range, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Douglas-fir	139	2,214	2,353
Ponderosa pine	250	4,760	5,010
Lodgepole pine	97	4,879	4,976
Whitebark pine	7	224	231
Limber pine	11	235	246
Subalpine fir	37	1,107	1,144
White fir	-20	374	354
Engelmann spruce	122	3,392	3,514
Total softwoods	643	17,185	17,828
Aspen	63	1,572	1,635
Cottonwood	3	752	755
Total hardwoods	66	2,324	2,390
All species	709	19,509	20,218

Table 30.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class and species in Colorado's southern Front Range, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - Thousand board feet, International ¼-inch rule - -		
Douglas-fir	712	17,916	18,628
Ponderosa pine	1,187	23,112	24,299
Lodgepole pine	27	2,933	2,960
Whitebark pine	13	625	638
Limber pine	26	882	908
Subalpine fir	59	1,921	1,980
White fir	-109	-362	-471
Engelmann spruce	449	10,846	11,295
Total softwoods	2,364	57,873	60,237
Aspen	291	9,298	9,589
Cottonwood	16	621	637
Total hardwoods	307	9,919	10,226
All species	2,671	67,792	70,463

Table 31.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland by ownership class and species in Colorado's southern Front Range, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - Thousand board feet, Scribner rule - - - -		
Douglas-fir	595	15,255	15,850
Ponderosa pine	988	19,243	20,231
Lodgepole pine	28	2,444	2,472
Whitebark pine	11	548	559
Limber pine	21	739	760
Subalpine fir	49	1,563	1,612
White fir	-96	-338	-434
Engelmann spruce	362	8,668	9,030
Total softwoods	1,958	48,122	50,080
Aspen	251	8,000	8,251
Cottonwood	14	563	577
Total hardwoods	265	8,563	8,828
All species	2,223	56,685	58,908

Table 32.--Net annual growth of growing stock on State and privately owned timberland by species and diameter class in Colorado's southern Front Range, 1982

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand cubic feet													
Douglas-fir	602	584	-147	264	405	424	180	81	-88	22	15	3	8	2,353
Ponderosa pine	1,075	1,450	851	559	498	-21	292	167	56	16	33	15	19	5,010
Lodgepole pine	4,002	682	189	73	30	--	--	--	--	--	--	--	--	4,976
Whitebark pine	61	41	36	43	24	17	5	4	--	--	--	--	--	231
Limber pine	64	15	32	73	23	5	7	10	1	--	5	8	3	246
Subalpine fir	428	268	379	48	--	15	6	--	--	--	--	--	--	1,144
White fir	233	261	-127	-70	-144	88	28	30	41	--	--	9	5	354
Engelmann spruce	667	635	611	758	284	210	188	90	36	13	22	--	--	3,514
Total softwoods	7,132	3,936	1,824	1,748	1,120	738	706	382	46	51	75	35	35	17,828
Aspen	1,234	488	-19	-174	79	27	--	--	--	--	--	--	--	1,635
Cottonwood	326	68	229	31	--	15	13	--	--	--	--	--	73	755
Total hardwoods	1,560	556	210	-143	79	42	13	--	--	--	--	--	73	2,390
All species	8,692	4,492	2,034	1,605	1,199	780	719	382	46	51	75	35	108	20,218

Table 33.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland by species and diameter class in Colorado's southern Front Range, 1982

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	10,802	1,680	2,329	2,421	1,022	478	-402	137	96	17	48	18,628
Ponderosa pine	14,803	3,220	2,899	27	1,656	930	308	90	178	81	107	24,299
Lodgepole pine	2,362	406	192	--	--	--	--	--	--	--	--	2,960
Whitebark pine	120	238	127	103	27	23	--	--	--	--	--	638
Limber pine	173	388	123	31	40	58	2	--	28	48	17	908
Subalpine fir	1,603	270	--	76	31	--	--	--	--	--	--	1,980
White fir	-623	-124	-594	408	112	115	165	--	--	45	25	-471
Engelmann spruce	2,100	4,519	1,617	1,159	974	485	218	79	144	--	--	11,295
Total softwoods	31,340	10,597	6,693	4,225	3,862	2,089	291	306	446	191	197	60,237
Aspen	XXXXX	9,005	439	145	--	--	--	--	--	--	--	9,589
Cottonwood	XXXXX	164	--	66	53	--	--	--	--	--	354	637
Total hardwoods	XXXXX	9,169	439	211	53	--	--	--	--	--	354	10,226
All species	31,340	19,766	7,132	4,436	3,915	2,089	291	306	446	191	551	70,463

Table 34.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland by species and diameter class in Colorado's southern Front Range, 1982

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Douglas-fir	9,600	1,315	1,831	1,904	804	412	-297	135	88	15	43	15,850
Ponderosa pine	11,702	2,880	2,596	55	1,483	832	275	81	159	72	96	20,231
Lodgepole pine	1,975	337	160	--	--	--	--	--	--	--	--	2,472
Whitebark pine	128	197	105	85	25	19	--	--	--	--	--	559
Limber pine	144	322	101	25	33	48	2	--	25	45	15	760
Subalpine fir	1,316	212	--	60	24	--	--	--	--	--	--	1,612
White fir	-486	-147	-520	319	87	90	158	--	--	43	22	-434
Engelmann spruce	1,858	3,465	1,235	885	766	401	214	77	129	--	--	9,030
Total softwoods	26,237	8,581	5,508	3,333	3,222	1,802	352	293	401	175	176	50,080
Aspen	XXXXX	7,749	376	126	--	--	--	--	--	--	--	8,251
Cottonwood	XXXXX	151	--	62	49	--	--	--	--	--	315	577
Total hardwoods	XXXXX	7,900	376	188	49	--	--	--	--	--	315	8,828
All species	26,237	16,481	5,884	3,521	3,271	1,802	352	293	401	175	491	58,908

Table 35.--Annual mortality of growing stock on State and privately owned timberland by ownership class and species in Colorado's southern Front Range, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Douglas-fir	43	1,000	1,043
Ponderosa pine	25	622	647
White fir	78	913	991
Engelmann spruce	--	727	727
Total softwoods	146	3,262	3,408
Aspen	--	594	594
Total hardwoods	--	594	594
All species	146	3,856	4,002

Table 36.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class and species in Colorado's southern Front Range, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- Thousand board feet, International ¼-inch rule -		
Douglas-fir	76	2,820	2,896
Ponderosa pine	100	1,932	2,032
White fir	262	2,923	3,185
Engelmann spruce	--	3,511	3,511
Total softwoods	438	11,186	11,624
Aspen	--	1,463	1,463
Total hardwoods	--	1,463	1,463
All species	438	12,649	13,087

Table 37.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by ownership class and species in Colorado's southern Front Range, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - Thousand board feet, Scribner rule - - - - -		
Douglas-fir	68	2,476	2,544
Ponderosa pine	88	1,696	1,784
White fir	225	2,547	2,772
Engelmann spruce	--	2,911	2,911
Total softwoods	381	9,630	10,011
Aspen	--	1,256	1,256
Total hardwoods	--	1,256	1,256
All species	381	10,886	11,267

Table 38.--Annual mortality of growing stock on State and privately owned timberland by species and diameter class in Colorado's southern Front Range, 1982

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	- Thousand cubic feet -													
Douglas-fir	--	245	543	71	--	--	--	--	184	--	--	--	--	1,043
Ponderosa pine	40	105	252	--	--	250	--	--	--	--	--	--	--	647
White fir	178	72	314	246	181	--	--	--	--	--	--	--	--	991
Engelmann spruce	--	--	--	380	190	157	--	--	--	--	--	--	--	727
Total softwoods	218	422	1,109	697	371	407	--	--	184	--	--	--	--	3,408
Aspen	XXXXX	--	286	308	--	--	--	--	--	--	--	--	--	594
Total hardwoods	XXXXX	--	286	308	--	--	--	--	--	--	--	--	--	594
All species	218	422	1,395	1,005	371	407	--	--	184	--	--	--	--	4,002

Table 39.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by species and diameter class in Colorado's southern Front Range, 1982

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	1,628	271	--	--	--	--	997	--	--	--	--	2,896
Ponderosa pine	753	--	--	1,279	--	--	--	--	--	--	--	2,032
White fir	1,302	1,103	780	--	--	--	--	--	--	--	--	3,185
Engelmann spruce	--	1,809	935	767	--	--	--	--	--	--	--	3,511
Total softwoods	3,683	3,183	1,715	2,046	--	--	997	--	--	--	--	11,624
Aspen	XXXXX	1,463	--	--	--	--	--	--	--	--	--	1,463
Total hardwoods	XXXXX	1,463	--	--	--	--	--	--	--	--	--	1,463
All species	3,683	4,646	1,715	2,046	--	--	997	--	--	--	--	13,087

Table 40.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by species and diameter class in Colorado's southern Front Range, 1982

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Douglas-fir	1,448	242	--	--	--	--	854	--	--	--	--	2,544
Ponderosa pine	671	--	--	1,113	--	--	--	--	--	--	--	1,784
White fir	1,158	946	668	--	--	--	--	--	--	--	--	2,772
Engelmann spruce	--	1,514	769	628	--	--	--	--	--	--	--	2,911
Total softwoods	3,277	2,702	1,437	1,741	--	--	854	--	--	--	--	10,011
Aspen	XXXXX	1,256	--	--	--	--	--	--	--	--	--	1,256
Total hardwoods	XXXXX	1,256	--	--	--	--	--	--	--	--	--	1,256
All species	3,277	3,958	1,437	1,741	--	--	854	--	--	--	--	11,267

Table 41.--Annual mortality of growing stock on State and privately owned timberland by cause of death and species in Colorado's southern Front Range, 1982

Species	Cause of death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown[1]	Total
	Thousand cubic feet								
Douglas-fir	--	133	--	--	910	--	--	--	1,043
Ponderosa pine	395	252	--	--	--	--	--	--	647
White fir	387	--	--	--	308	57	58	181	991
Engelmann spruce	--	157	--	--	--	--	--	570	727
Total softwoods	782	542	--	--	1,218	57	58	751	3,408
Aspen	--	171	--	--	--	--	--	423	594
Total hardwoods	--	171	--	--	--	--	--	423	594
All species	782	713	--	--	1,218	57	58	1,174	4,002

[1]Because many destructive agents often attack trees in concert or in succession, it is often difficult to identify the actual causal agent. When the primary cause of death cannot be precisely determined, it is listed as unknown.

Table 42.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by cause of death and species in Colorado's southern Front Range, 1982

Species	Cause of death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown[1]	Total
	Thousand board feet, International ¼-inch rule								
Douglas-fir	--	272	--	--	2,624	--	--	--	2,896
Ponderosa pine	1,279	753	--	--	--	--	--	--	2,032
White fir	1,302	--	--	--	1,103	--	--	780	3,185
Engelmann spruce	--	767	--	--	--	--	--	2,744	3,511
Total softwoods	2,581	1,792	--	--	3,727	--	--	3,524	11,624
Aspen	--	838	--	--	--	--	--	625	1,463
Total hardwoods	--	838	--	--	--	--	--	625	1,463
All species	2,581	2,630	--	--	3,727	--	--	4,149	13,087

[1]Because many destructive agents often attack trees in concert or in succession, it is often difficult to identify the actual causal agent. When the primary cause of death cannot be precisely determined, it is listed as unknown.

Table 43.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by cause of death and species in Colorado's southern Front Range, 1982

Species	Cause of death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown[1]	Total
	Thousand board feet, Scribner rule								
Douglas-fir	--	242	--	--	2,302	--	--	--	2,544
Ponderosa pine	1,113	671	--	--	--	--	--	--	1,784
White fir	1,159	--	--	--	946	--	--	667	2,772
Engelmann spruce	--	627	--	--	--	--	--	2,284	2,911
Total softwoods	2,272	1,540	--	--	3,248	--	--	2,951	10,011
Aspen	--	717	--	--	--	--	--	539	1,256
Total hardwoods	--	717	--	--	--	--	--	539	1,256
All species	2,272	2,257	--	--	3,248	--	--	3,490	11,267

[1]Because many destructive agents often attack trees in concert or in succession, it is often difficult to identify the actual causal agent. When the primary cause of death cannot be precisely determined, it is listed as unknown.

Table 44.--Area of State and privately owned woodland by ownership class and forest type in Colorado's southern Front Range, 1983

Forest type	Ownership class		
	State	Nonindustrial private	Total
	Acres		
Pinyon-juniper	60,471	733,108	793,579
Juniper	18,231	191,381	209,612
Total woodland softwoods	78,702	924,489	1,003,191
Oak	1,824	57,569	59,393
Other west hardwoods	229	9,504	9,733
Total woodland hardwoods	2,053	67,073	69,126
All types	80,755	991,562	1,072,317

Table 45.--Net volume of State and privately owned woodland by ownership class and species in Colorado's southern Front Range, 1983

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Douglas-fir	--	--	--
Ponderosa pine	9	111	120
Aspen	--	--	--
Pinyon/juniper	26,166	301,383	327,549
Woodland hardwoods	764	9,463	10,227
All species	26,939	310,957	337,896

Table 46.--Net annual growth of State and privately owned woodland by ownership class and species in Colorado's southern Front Range, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Douglas-fir	--	--	--
Ponderosa pine	([1])	2	2
Aspen	--	--	--
Pinyon/juniper	367	4,268	4,635
Woodland hardwoods	-13	-78	-91
All species	354	4,192	4,546

[1]Less than 500 cubic feet.

Table 47.--Annual mortality of State and privately owned woodland by ownership class and species in Colorado's southern Front Range, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - Thousand cubic feet - - - - - - -		
Douglas-fir	--	--	--
Ponderosa pine	--	--	--
Aspen	--	--	--
Pinyon/juniper	2	69	71
Woodland hardwoods	35	341	376
All species	37	410	447

Table 48.--Area of State and privately owned timberland by county and ownership class in Colorado's southern Front Range, 1983

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - - - Acres - - - - - - - - - - - -		
Chaffee	3,234	32,883	36,117
Costilla	--	189,272	189,272
Custer	3,316	76,721	80,037
Fremont	10,513	75,596	86,109
Huerfano	5,441	100,586	106,027
Las Animas	15,684	368,057	383,741
Pueblo	4,623	62,536	67,159
Total	42,811	905,651	948,462

Table 49.--Net volume of growing stock on State and privately owned timberland by county and ownership class in Colorado's southern Front Range, 1983

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Chaffee	4,114	38,360	42,474
Costilla	--	309,373	309,373
Custer	3,776	87,736	91,512
Fremont	10,358	66,451	76,809
Huerfano	5,791	103,255	109,046
Las Animas	12,862	360,051	372,913
Pueblo	2,495	51,813	54,308
Total	39,396	1,017,039	1,056,435

Table 50.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by county and ownership class in Colorado's southern Front Range, 1983

County	Ownership class		
	State	Nonindustrial private	Total
	- - Thousand board feet, International ¼-inch rule - -		
Chaffee	13,428	118,396	131,824
Costilla	--	892,199	892,199
Custer	12,133	274,745	286,878
Fremont	28,434	185,743	214,177
Huerfano	17,316	318,423	335,739
Las Animas	41,925	1,142,518	1,184,443
Pueblo	9,495	163,475	172,970
Total	122,731	3,095,499	3,218,230

Table 51.--Net volume of sawtimber (International ¼-inch rule) on State and private timberland by county and ownership class in Colorado's southern Front Range, 1983

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - Thousand board feet, Scribner rule - - - - -		
Chaffee	11,328	99,993	111,321
Costilla	--	756,854	756,854
Custer	10,251	232,179	242,430
Fremont	24,156	157,659	181,815
Huerfano	14,632	269,070	283,702
Las Animas	35,322	963,141	998,463
Pueblo	8,092	138,567	146,659
Total	103,781	2,617,463	2,721,244

Table 52.--Net annual growth of growing stock on State and privately owned timberland by county and ownership class in Colorado's southern Front Range, 1982

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Chaffee	73	778	851
Costilla	--	6,504	6,504
Custer	74	1,680	1,754
Fremont	186	1,307	1,493
Huerfano	141	2,315	2,456
Las Animas	193	5,875	6,068
Pueblo	42	1,050	1,092
Total	709	19,509	20,218

Table 53.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland by county and ownership class in Colorado's southern Front Range, 1982

County	Ownership class		
	State	Nonindustrial private	Total
	- - Thousand board feet, International ¼-inch rule - -		
Chaffee	544	4,572	5,116
Costilla	--	18,209	18,209
Custer	362	9,611	9,973
Fremont	282	2,087	2,369
Huerfano	630	11,743	12,373
Las Animas	579	15,860	16,439
Pueblo	274	5,710	5,984
Total	2,671	67,792	70,463

Table 54.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland by county and ownership class in Colorado's southern Front Range, 1982

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - Thousand board feet, Scribner rule - - - - -		
Chaffee	451	3,802	4,253
Costilla	--	15,179	15,179
Custer	303	8,037	8,340
Fremont	232	1,749	1,981
Huerfano	512	9,602	10,114
Las Animas	504	13,603	14,107
Pueblo	221	4,713	4,934
Total	2,223	56,685	58,908

Table 55.--Annual mortality of growing stock on State and privately owned timberland by county and ownership class in Colorado's southern Front Range, 1982

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Chaffee	12	110	122
Costilla	--	1,875	1,875
Custer	13	339	352
Fremont	68	411	479
Huerfano	16	288	304
Las Animas	23	637	660
Pueblo	14	196	210
Total	146	3,856	4,002

Table 56.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by county and ownership class in Colorado's southern Front Range, 1982

County	Ownership class		
	State	Nonindustrial private	Total
	- - Thousand board feet, International ¼-inch rule - -		
Chaffee	33	304	337
Costilla	--	6,952	6,952
Custer	30	859	889
Fremont	261	1,626	1,887
Huerfano	44	759	803
Las Animas	57	1,756	1,813
Pueblo	13	393	406
Total	438	12,649	13,087

Table 57.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by county and ownership class in Colorado's southern Front Range, 1982

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - Thousand board feet, Scribner rule - - - - -		
Chaffee	29	266	295
Costilla	--	5,887	5,887
Custer	26	754	780
Fremont	225	1,406	1,631
Huerfano	39	667	706
Las Animas	51	1,563	1,614
Pueblo	11	343	354
Total	381	10,886	11,267

Table 58.--Area of State and privately owned woodland by county and ownership class in Colorado's southern Front Range, 1983

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - - - - Acres - - - - - - - - - - - -		
Chaffee	1,118	18,851	19,969
Costilla	--	82,241	82,241
Custer	501	16,122	16,623
Fremont	14,384	112,298	126,682
Huerfano	7,988	131,176	139,164
Las Animas	48,316	564,746	613,062
Pueblo	8,448	66,128	74,576
Total	80,755	991,562	1,072,317

Table 59.--Net volume of State and privately owned woodland by county and ownership class in Colorado's southern Front Range, 1983

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Chaffee	560	7,115	7,675
Costilla	--	21,549	21,549
Custer	91	4,989	5,080
Fremont	6,518	50,343	56,861
Huerfano	3,461	53,681	57,142
Las Animas	13,366	149,947	163,313
Pueblo	2,943	23,333	26,276
Total	26,939	310,957	337,896

Table 60.--Net annual growth of State and privately owned woodland by county and ownership class in Colorado's southern Front Range, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Chaffee	9	99	108
Costilla	--	273	273
Custer	1	79	80
Fremont	67	455	522
Huerfano	52	818	870
Las Animas	183	2,125	2,308
Pueblo	42	343	385
Total	354	4,192	4,546

Table 61.--Annual mortality of State and privately owned woodland by county and ownership class in Colorado's southern Front Range, 1982

County	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Chaffee	([1])	6	6
Costilla	--	41	41
Custer	([1])	3	3
Fremont	34	332	366
Huerfano	1	8	9
Las Animas	1	15	16
Pueblo	1	5	6
Total	37	410	447

[1]Less than 500 cubic feet.

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Presents land area, timberland area, woodland area, timber inventory, and growth and mortality data for seven counties in Colorado's southern Front Range. Information and statistical tables are based on Forest Survey data collected from 1982 and 1983 and cover State and private resources.

KEYWORDS: timberland, woodland, growing-stock volume, net annual growth, roundwood harvest, fuelwood harvest

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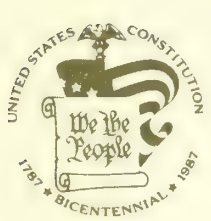

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West-Central Colorado: Forest Statistics for State and Private Land, 1983

Roger C. Conner
Susan S. Brown

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This report is the result of the combined efforts of numerous people on the Forest Survey staff. In addition to the photo interpretation and field crews, several individuals played key roles in the reduction of basic data into information describing the extent, nature, and condition of the forest resources in Colorado: Dennis Collins supervised the data collection; Sharon Woudenberg and Shirley Waters compiled the data and made summaries; and Velma Inama transformed the data summaries into tables of information. Also, acknowledgment is given to the Colorado State Forest Service for its cooperation and assistance in collecting the inventory data. And we extend a special note of gratitude to the private land owners who allowed the field crews access to the sample locations on their properties.

RESEARCH SUMMARY

Presents land area, timberland area, woodland area, timber inventory, and growth and mortality data for 14 counties in west-central Colorado. Information and statistical tables are based on Forest Survey data collected from 1982 and 1983 and cover State and private resources.

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West-Central Colorado: Forest Statistics for State and Private Land, 1983

Roger C. Conner
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INTRODUCTION

This resource bulletin reports the findings of the Forest Survey inventory of a sample area defined as State and private lands in Alamosa, Conejos, Eagle, Grand, Gunnison, Hinsdale, Jackson, Mineral, Pitkin, Rio Grande, Routt, Saguache, San Juan, and Summit Counties in west-central Colorado (fig. 1). The two-phase survey began with prefield work in June 1981. The field phase involved, in whole or in part, successive summers from 1981 to 1984 with the bulk of the data collected in 1982.

The data in this report pertain only to the State and private forest resources of the counties listed above. Data for lands administered by various public agencies such as National Forest Systems and Bureau of Land Management will be included in a subsequent, comprehensive statewide

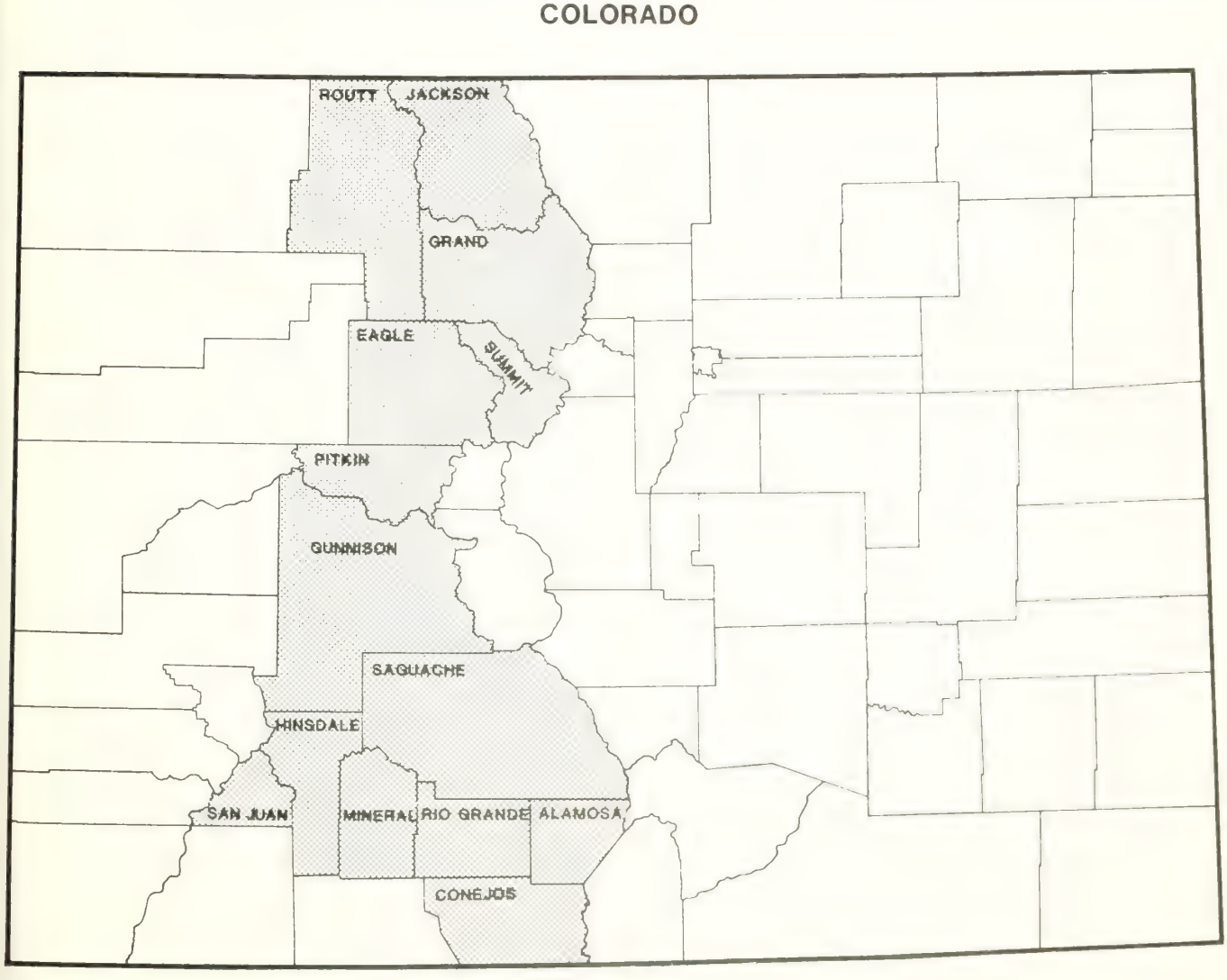

Figure 1—Counties covered by this report.

report that will include all lands and all owners.

The primary objective of Forest Survey—a continuing, nationwide undertaking of the Forest Service, U.S. Department of Agriculture—is to provide an assessment of the renewable resources for forest and rangelands of the Nation. Fundamental to the accomplishment of the objective are the periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

The Intermountain Research Station with headquarters in Ogden, UT, conducts the forest resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, western South Dakota, Utah, Wyoming, western Texas, and Oklahoma's Panhandle. These inventories provide information on the extent and condition of State and privately owned forest lands and most other lands not in the National Forest System, volume of timber, and rates of timber growth, removals, and mortality.

These data, when combined with similar information on National Forest lands, provide a basis for forming forest policies and programs and for the orderly development and use of the resources.

HIGHLIGHTS

Area

- State and private land accounts for 4.3 million acres, 32 percent of the total land area in west-central Colorado (fig. 2).
- Over 1 million acres of this area (24 percent) is considered forest land.
- Of the forest land, 805,000 acres (79 percent) are classified as timberland, 86 percent of which is privately owned.
- Over 217,000 acres are classified as woodland and 88 percent of this is privately owned.
- Aspen forest type occupies nearly 46 percent of the timberland area, while lodgepole pine (22 percent), spruce/subalpine fir (11 percent), and Douglas-fir (9 percent) add another 42 percent.
- Oak is the predominant forest type on woodland and occupies over 149,000 acres, nearly 69 percent of the area.

Inventory

- Timberland growing-stock volume is nearly 1.4 billion cubic feet, and sawtimber volume totals almost 3.4 billion board feet (International ¼-inch rule).
- Aspen species accounts for nearly 39 percent (538 million cubic feet) of the timberland net volume, with lodgepole pine (30 percent), Engelmann spruce (13 percent), and subalpine fir (10 percent) adding to the remaining percentage.
- Over 85 percent of the timberland growing-stock volume is privately owned.
- Woodland volume amounts to over 80 million cubic feet, 87 percent of which is on private land.
- About 92 percent of the timberland growing-stock volume is in trees less than 17 inches diameter at breast height (d.b.h).
- Nearly 90 percent of the sawtimber volume is in trees less than 19 inches d.b.h.

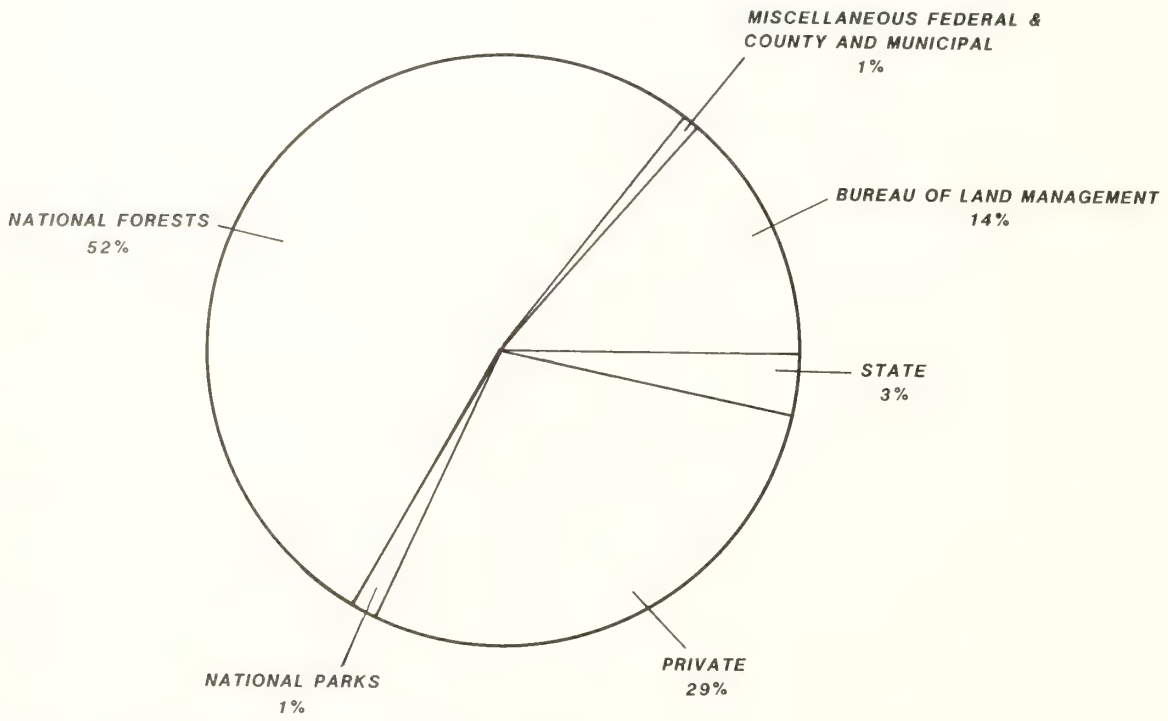

Figure 2—Distribution of land area in west-central Colorado by owner group.

- Over 54 percent of the timberland area is capable of producing more than 50 cubic feet of wood per acre per year. However, average growth for 1982 was about 34 cubic feet per acre per year.
- The volume in cull and salvable dead trees totals 106 million cubic feet for timberland, and only 6 percent of this volume is in rotten cull trees.
- Less than 7 percent of the timberland area is considered medium to fully stocked with desirable trees, and over 3 percent of the area (27,000 acres) is nonstocked.
- About 22 percent of the timberland growing-stock volume and 31 percent of the woodland volume is in Routt County.

Components of Change

Growth

- Timberland net annual growth was 27.4 million cubic feet in 1982, and sawtimber growth totaled 103 million board feet (International ¼-inch rule).
- Subalpine fir and lodgepole pine combined account for 33 percent of the sawtimber net growth.
- Woodland net annual growth was 1.7 million cubic feet in 1982, of which 77 percent was accounted for by hardwoods.
- Of the timberland net growth 86 percent is on private land, as is 89 percent of the woodland net growth.

Mortality

- Annual mortality on timberland of 5 million cubic feet offsets 16 percent of the gross annual growth.
- Lodgepole pine accounts for nearly 50 percent of the annual sawtimber mortality (International ¼-inch rule).

Removals

- Total industrial roundwood harvest was nearly 9.4 million cubic feet in 1982, about 11 percent of which came from State and private land (McLain and Booth 1985).
- Spruce and lodgepole pine combined account for over 85 percent of the harvest, amounting to nearly 8 million cubic feet (includes all land owners in the sample area).
- Sawlogs accounted for 93 percent of the industrial roundwood volume harvested (includes all land owners in the sample area).
- Of the industrial roundwood removed from State and private land, 37 percent was from Jackson County.
- Over 106,000 cords of fuelwood (8.5 million cubic feet) were harvested in 1982, about 46 percent of which came from State and private land.
- Lodgepole pine accounted for nearly 38 percent of the fuelwood harvest, with ponderosa pine (22 percent), aspen (18 percent), and pinyon (14 percent) adding to the remaining percentage (includes all land owners in the sample area).
- Routt County accounted for more than 56 percent of the fuelwood harvest and 28 percent of the fuelwood volume harvested from State and private land.
- Over 47,000 cords of fuelwood (99 percent) harvested from State and private land were from dead trees (McLain 1985).

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics at the State and sample area levels.

Prefield

Primary area estimates were based on the classification of 54,106 sample points systematically placed on the latest aerial photographs available. The photo points, adjusted to meet known land areas, were used to stratify and compute area expansion factors for the field sample data.

Field

Land classification and estimates for timber characteristics and volume were based on observations or measurements or both recorded at 939 ground sample locations, of which 410 were forested. Sample trees were selected using a 5-point sample cluster, which included 1/300-acre fixed radius plots for trees less than 5 inches d.b.h., and 40 basal area factor variable radius plots for trees 5 inches d.b.h. or larger.

Compilation

All photo and field data were loaded onto tape and stored for computer editing, computation, and tabulation. Final estimates from these data were based on statistical summaries, a portion of which is included in this bulletin. Volume and defect were computed using equations developed by Edminster and others (1980, 1981), Kemp (1958), Chojnacky (1985), Meyers (1964), and Meyers and others (1972).

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on small sample sizes resulting in high sampling errors. The standard error percentages shown in tables 1 and 2 were calculated at the 67 percent confidence level.

TERMINOLOGY AND DATA TABLES

The following section contains definitions that are relevant to the timber resource data in this bulletin. Forest area and timber resource data for west-central Colorado are displayed in tables 3 through 61.

TERMINOLOGY

Acceptable trees—Growing-stock trees meeting specified standards of size and quality, but not qualifying as desirable trees.

Area condition class—A classification of timberland reflecting the degree to which the site is being utilized by growing-stock trees and other conditions affecting current and prospective timber growth (see Stocking):

Class 10—Areas fully stocked with desirable trees and not overstocked.

Class 20—Areas fully stocked with desirable trees but overstocked with all live trees.
Class 30—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees, or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.
Class 40—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees, or conditions that ordinarily prevent occupancy by desirable trees, or both.
Class 50—Areas poorly stocked with desirable trees but fully stocked with growing-stock trees.
Class 60—Areas poorly stocked with desirable trees but with medium to full stocking of growing-stock trees.
Class 70—Areas nonstocked or poorly stocked with desirable trees and poorly stocked with growing-stock trees.
Class 80—Low-risk old-growth stands.
Class 90—High-risk old-growth stands.
Nonstocked—Areas less than 10 percent stocked with growing-stock trees.

Basal area—The cross-sectional area of a tree expressed in square feet. For timber species the calculation is based on diameter at breast height (d.b.h.); for woodland species it is based on diameter at root collar (d.r.c.).

Cord—A pile of stacked wood equivalent to 128 cubic feet of wood and air space having standard dimensions of 4 by 4 by 8 feet.

Cull trees—Live trees that are unmerchantable now or prospectively (see Rough trees and Rotten trees).

Cull volume—Portions of a tree's volume that are not usable for wood products because of rot, form, missing material, or other cubic-foot defect. Form and sound defects include severe sweep and crook, forks, extreme form reduction, large deformities, and dead material.

Deferred forest land—Forest lands within the National Forest System that are under study for possible inclusion in the Wilderness System.

Desirable trees—Growing-stock trees (1) having no serious defect in quality to limit present or prospective use for timber products, (2) of relatively high vigor, and (3) containing no pathogens that may result in death or serious deterioration within the next decade.

Diameter at breast height (*d.b.h.*)—Diameter of the stem measured at 4.5 feet above the ground.

Diameter at root collar (*d.r.c.*)—Diameter equivalent at the point nearest the ground line that represents the basal area of the tree stem or stems.

Diameter classes—Tree diameters, either d.b.h. or d.r.c., grouped into 2-inch classes labeled by the midpoint of the class.

Farmer-owned lands—Lands owned by a person who operates a farm and who either does the work or directly supervises the work.

Forest industry lands—Lands owned by companies or individuals operating a primary wood-processing plant.

Forest land—Land at least 10 percent stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.

Forest trees—Woody plants having a well-developed stem or stems, usually more than 12 feet in height at maturity, with a generally well-defined crown.

Forest type—A classification of forest land based upon and named for the tree species presently forming a plurality of live-tree stocking.

Growing-stock trees—Live sawtimber trees, poletimber trees, saplings, and seedlings of timber species meeting specified standards of quality and vigor; excludes cull trees.

Growing-stock volume—Net cubic-foot volume in live growing-stock trees from a 1-foot stump to a minimum 4-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.

Growth—See definition for Net annual growth.

Hardwood trees—Dicotyledonous trees, usually broad-leaved and deciduous.

High-risk old-growth stands—Timber stands over 100 years old in which the majority of the trees are not expected to survive more than 10 years.

Indian lands—Indian lands held in trust by the Federal Government.

Industrial wood—All commercial roundwood products except fuelwood.

Land area—The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains, streams, sloughs, estuaries, and canals less than 120 feet wide; and lakes, reservoirs, and ponds less than 1 acre in size.

Logging residues—The unused portions of growing-stock trees cut or killed by logging.

Low-risk old-growth stands—Timber stands over 100 years old in which the majority of the trees are expected to survive more than 10 years.

Miscellaneous Federal lands—Lands administered by Federal agencies other than the Forest Service, U.S. Department of Agriculture, or Bureau of Land Management, U.S. Department of the Interior.

Mortality—The net volume of growing-stock trees that have died from natural causes during a specified period.

National Forest lands—Public lands administered by the Forest Service, U.S. Department of Agriculture.

National Resource lands—Public lands administered by the Bureau of Land Management, U.S. Department of the Interior.

Net annual growth—The net average annual increase in the volume of trees during a specified period.

Net volume in board feet—The gross board-foot volume in the sawlog portion of growing-stock trees, less deductions for cull volume.

Net volume in cubic feet—Gross cubic-foot volume in the merchantable portion of trees less deductions for cull volume. For timber species, volume is computed for the merchantable stem from a 1-foot stump to a minimum 4-inch top diameter outside bark, or to the point where the central stem breaks into limbs. For woodland species, volume is computed outside bark (o.b.) for all woody material above d.r.c. that is larger than 1.5 inches in diameter (o.b.).

Nonforest land—Land that does not currently qualify as forest land.

Nonindustrial private—All private ownerships except forest industry.

Nonstocked areas—Forest land less than 10 percent stocked with live trees.

Old-growth stands—Stands of timber species over 100 years old.

Other private land—Privately owned land other than forest industry or farmer-owned.

Other public land—Public land administered by agencies other than the Forest Service, U.S. Department of Agriculture.

Other removals—The net volume of growing-stock trees removed from the inventory by cultural operations such as timber-stand improvement, by land clearing, and by changes in land use such as a shift to wilderness.

Poletimber stands—Stands at least 10 percent stocked with growing-stock trees, in which half or more of the stocking is sawtimber or poletimber trees or both, with poletimber stocking exceeding that of sawtimber (see definition for Stocking).

Poletimber trees—Live trees of timber species at least 5 inches d.b.h. but smaller than sawtimber size.

Potential growth—The average net annual cubic-foot growth per acre at culmination of mean annual growth attainable in fully stocked natural stands.

Primary wood-processing plants—Plants using roundwood products such as sawlogs, pulpwood bolts, veneer logs, etc.

Productivity class—A classification of forest land in terms of potential growth.

Removals—The net volume of growing-stock trees removed from the inventory by harvesting, cultural operations, land clearings, or changes in land use.

Reserved forest land—Forest land withdrawn from tree utilization through statute or administrative designation.

Residues:

Coarse residues—Plant residues suitable for chipping, such as slabs, edgings, and ends.

Fine residues—Plant residues not suitable for chipping, such as sawdust, shavings, and veneer clippings.

Plant residues—Wood materials from primary manufacturing plants that are not used for any product.

Rotten tree—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot) and with more than half of the cull volume attributable to rotten or missing material.

Rough tree—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot) and with less than half of the cull volume attributable to rotten or missing material.

Roundwood—Logs, bolts, or other round sections cut from trees.

Salvable dead trees—Standing or down dead trees that are currently merchantable by regional standards.

Saplings—Live trees of timber species 1 to 4.9 inches d.b.h., or woodland species 1 to 2.9 inches d.r.c.

Sapling and seedling stands—Timberland stands at least 10 percent stocked on which more than half of the stocking is saplings or seedlings or both.

Sawlog portion—That part of the bole of sawtimber trees between a 1-foot stump and the sawlog top.

Sawlog top—The point on the bole of sawtimber trees above which a sawlog cannot be produced. The minimum sawlog top is 7 inches diameter o.b. for softwoods, and 9 inches diameter o.b. for hardwoods.

Sawtimber stands—Stands at least 10 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber trees—Live trees of timber species meeting regional size and defect specifications. Softwood trees must be at least 9 inches d.b.h. and hardwood trees 11 inches d.b.h.

Sawtimber volume—Net volume in board feet of the sawlog portion of live sawtimber trees.

Seedlings—Established live trees of timber species less than 1 inch d.b.h. or woodland species less than 1 inch d.r.c.

Softwood trees—Monocotyledonous trees, usually evergreen, having needle or scalelike leaves.

Standard error—An expression of the degree of confidence that can be placed on an estimated total or average obtained by statistical sampling methods. Standard errors do not include technique errors that could occur in photo classification of areas, field measurements, or compilation of data.

Stand-size classes—A classification of forest land based on the predominant size of trees present (see Sawtimber stands, Poletimber stands, and Sapling and seedling stands).

State, county, and municipal lands—Lands administered by States, counties, or local public agencies, or lands leased by these governmental units for more than 50 years.

Stocking—An expression of the extent to which growing space is effectively utilized by present or potential growing-stock trees of timber species. Percentage stocking is the ratio of actual stocking to full stocking for comparable sites and stands, using basal area as the basis for comparison.

Timberland—Forest land where timber species make up at least 10 percent stocking.

Timber species—Tree species traditionally used for industrial wood products. In the Rocky Mountain States, these include aspen and cottonwood hardwood species and all softwood species except pinyon and juniper.

Timber stand improvement—Treatments such as thinning, pruning, release cutting, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.

Upper-stem portion—That part of the main stem or fork of sawtimber trees above the sawlog top to a minimum top diameter of 4 inches o.b. or to the point where the main stem or fork breaks into limbs.

Water—Streams, sloughs, estuaries, and canals more than 120 feet wide, and lakes, reservoirs, and ponds more than 1 acre in size at mean high water level.

Wilderness—An area of undeveloped land currently included in the Wilderness System, managed so as to preserve its natural conditions and retain its primeval character and influence.

Woodland—Forest land where timber species make up less than 10 percent stocking.

Woodland species dead volume—Net volume of dead woodland trees and dead net volume portion of live woodland tree species.

Woodland species live volume—Net cubic-foot volume in live woodland tree species.

Woodland species—Tree species not usually converted into industrial wood products. Common uses are fuelwood, fenceposts, and Christmas trees.

REFERENCES

Chojnacky, David C. 1985. Pinyon-juniper volume equations for the central Rocky Mountain States. Res. Pap. INT-339. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 27 p.

Edminster, Carleton B.; Mowrer, H. Todd; Hinds, Thomas E. 1981. Volume tables and point-sampling factors for aspen in Colorado. Res. Pap. RM-232. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.

Edminster, Carleton B.; Beeson, Robert T.; Metcalf, Gary E. 1980. Volume tables and point-sampling factors for ponderosa pine in the Front Range of Colorado. Res. Pap. RM-218. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 14 p.

Kemp, Paul D. 1958. Volume tables. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Ogden, UT.

McLain, William H. 1985. Colorado's industrial roundwood production and mill residues, 1982. Resour. Bull. INT-35. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 13 p.

McLain, William H.; Booth, Gordon D. 1985. Colorado's 1982 fuelwood harvest. Resour. Bull. INT-36. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 11 p.

Meyers, Clifford A. 1964. Volume tables and point-sampling factors for lodgepole pine in Colorado and Wyoming. Res. Pap. RM-6. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.

Meyers, Clifford A.; Edminster, Carleton B. 1972. Volume tables and point-sampling factors for Engelmann spruce in Colorado and Wyoming. Res. Pap. RM-95. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 23 p.

FOREST SURVEY TABLES

Table 1.--Area of State and privately owned forest land with percent standard error in west-central Colorado, 1983

Item	Softwoods		Hardwoods		All types	
	Acres	Percent standard error	Acres	Percent standard error	Acres	Percent standard error
Timberland	404,837	± 6.4	399,728	± 7.8	804,565	± 3.8
Woodland	67,706	±20.2	148,881	±16.1	216,587	±12.7
Reserved forest land:[1]						
Timberland	688		--		688	
Woodland	--		502		502	
Total forest land	473,231		549,111		1,022,342	

[1]Reserved land areas are estimated from aerial photos without field verification; therefore, standard errors are not calculated.

Table 2.--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on State and privately owned timberland with percent standard error in west-central Colorado

Item	Softwoods		Hardwoods		All species	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume, 1983:						
Growing stock (M cubic feet)	827,277	± 9.3	556,014	±10.5	1,383,291	± 7.0
Sawtimber[1] (M board feet)	2,628,550	±10.0	755,764	±16.4	3,384,314	± 8.8
Sawtimber[2] (M board feet)	2,231,811	±10.0	643,579	±16.3	2,875,390	± 8.8
Net annual growth, 1982:						
Growing stock (M cubic feet)	14,169	±13.6	13,255	±14.0	27,424	±10.3
Sawtimber[1] (M board feet)	60,476	±19.5	42,787	±37.7	103,263	±20.6
Sawtimber[2] (M board feet)	51,642	±19.9	36,838	±37.7	88,480	±20.8
Annual mortality, 1982:						
Growing stock (M cubic feet)	2,439	±28.8	2,589	±32.8	5,028	±24.4
Sawtimber[1] (M board feet)	10,150	±33.7	3,158	±59.4	13,308	±33.5
Sawtimber[2] (M board feet)	8,543	±33.6	2,684	±59.4	11,227	±33.3

[1]International ¼-inch rule.

[2]Scribner rule.

Table 3.--Total land and water area by ownership class in west-central Colorado, 1983

Ownership class	Area
	- - Acres - -
Land:	
Public:	
National Forest	6,967,512
National Parks[1]	164,038
Other:	
Bureau of Land Management	1,865,495
Miscellaneous federal	44,964
State	404,068
County and municipal	9,881
Total other public	2,324,408
Total public	9,455,958
Private	3,857,661
Total land area	13,313,619
Census water	56,646
Total land and water[2]	13,370,265

[1]Not included with miscellaneous Federal, a component of other public, for purpose of clarity.

[2]U.S. Bureau of the Census, land and water area of the United States, 1980.

Table 4.--Total land area on State and privately owned land by major land class and ownership class in west-central Colorado, 1983

Land class	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - - - - - Acres - - - - - - - - - - - - -		
Timberland:			
Reserved	688	--	688
Nonreserved	115,024	689,541	804,565
Total	115,712	689,541	805,253
Woodland:			
Reserved	502	--	502
Nonreserved	25,317	191,270	216,587
Total	25,819	191,270	217,089
Total forest land:			
Reserved	1,190	--	1,190
Nonreserved	140,341	880,811	1,021,152
Total	141,531	880,811	1,022,342
Nonforest land	262,537	2,976,850	3,239,387
Total land area	404,068	3,857,661	4,261,729

Table 5.--Area of forest land on State and privately owned land by forest type, ownership class, and land class in west-central Colorado, 1983

Forest type	Ownership class and land class						
	State		Nonindustrial private		All owners		
	Reserved	Nonreserved	Reserved	Nonreserved	Reserved	Nonreserved	Total
	- Acres -						
Douglas-fir	502	5,448	--	64,617	502	70,065	70,567
Ponderosa pine	--	1,327	--	15,033	--	16,360	16,360
Lodgepole pine	--	39,178	--	135,451	--	174,629	174,629
Limber pine	--	1,732	--	5,427	--	7,159	7,159
Spruce subalpine-fir	--	14,271	--	71,313	--	85,584	85,584
White fir	--	2,191	--	6,575	--	8,766	8,766
Spruce	186	7,955	--	34,319	186	42,274	42,460
Aspen	--	42,258	--	327,450	--	369,708	369,708
Cottonwood	--	664	--	29,356	--	30,020	30,020
Total timberland	688	115,024	--	689,541	688	804,565	805,253
Pinyon-juniper	--	8,833	--	47,288	--	56,121	56,121
Juniper	--	1,016	--	10,569	--	11,585	11,585
Oak	502	15,468	--	133,413	502	148,881	149,383
Total woodland	502	25,317	--	191,270	502	216,587	217,089
Total all types	1,190	140,341	--	880,811	1,190	1,021,152	1,022,342

Table 6.--Cubic feet of net volume in trees on State and privately owned forest land by species and ownership class in west-central Colorado, 1983

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - Thousand cubic feet - - - - - - -		
Douglas-fir	7,997	81,349	89,346
Ponderosa pine	167	2,037	2,204
Lodgepole pine	85,500	322,252	407,752
Limber pine	894	4,032	4,926
Subalpine fir	17,338	114,828	132,166
White fir	2,509	8,797	11,306
Engelmann spruce	32,463	147,114	179,577
Aspen	57,049	485,108	542,157
Cottonwood	495	17,973	18,468
Total timberland species	204,412	1,183,490	1,387,902
Pinyon/juniper	6,603	40,853	47,456
Woodland hardwoods	4,451	34,769	39,220
Total woodland species	11,054	75,622	86,676
Total all species	215,466	1,259,112	1,474,578

Table 7.--Cubic feet of net annual growth in trees on State and privately owned forest land by species and ownership class in west-central Colorado, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - Thousand cubic feet - - - - - - -		
Douglas-fir	194	1,768	1,962
Ponderosa pine	1	16	17
Lodgepole pine	1,599	5,418	7,017
Limber pine	9	39	48
Subalpine fir	297	1,671	1,968
White fir	40	136	176
Engelmann spruce	469	2,512	2,981
Aspen	1,311	11,530	12,841
Cottonwood	17	522	539
Total timberland species	3,937	23,612	27,549
Pinyon/juniper	47	307	354
Woodland hardwoods	144	1,177	1,321
Total woodland species	191	1,484	1,675
Total all species	4,128	25,096	29,224

Table 8.--Cubic feet of annual mortality in trees on State and privately owned forest land by species and ownership class in west-central Colorado, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - Thousand cubic feet - - - - - - -		
Lodgepole pine	205	1,290	1,495
Subalpine fir	109	602	711
White fir	41	124	165
Engelmann spruce	5	63	68
Aspen	243	2,354	2,597
Total timberland species	603	4,433	5,036
Woodland hardwoods	1	8	9
Total woodland species	1	8	9
Total all species	604	4,441	5,045

Table 9.--Area of State and privately owned timberland by forest type, stand-size class, and productivity class in west-central Colorado, 1983

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - Acres - - - - - - - - - - - -				
Douglas-fir:					
Sawtimber	--	20,617	37,108	--	57,725
Poletimber	--	4,239	--	--	4,239
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	8,101	--	8,101
Total	--	24,856	45,209	--	70,065
Ponderosa pine:					
Sawtimber	--	--	3,862	--	3,862
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	12,498	--	12,498
Total	--	--	16,360	--	16,360
Lodgepole pine:					
Sawtimber	7,152	60,874	32,484	--	100,510
Poletimber	8,188	7,160	42,854	--	58,202
Sapling and seedling	--	--	15,917	--	15,917
Nonstocked	--	--	--	--	--
Total	15,340	68,034	91,255	--	174,629
Limber pine:					
Sawtimber	--	--	--	7,159	7,159
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	7,159	7,159
Spruce-subalpine fir:					
Sawtimber	--	29,559	14,875	--	44,434
Poletimber	--	12,050	7,152	--	19,202
Sapling and seedling	--	14,796	7,152	--	21,948
Nonstocked	--	--	--	--	--
Total	--	56,405	29,179	--	85,584

(con.)

Table 9. (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - Acres - - - - - - - - - - - -				
White fir:					
Sawtimber	8,766	--	--	--	8,766
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	8,766	--	--	--	8,766
Spruce:					
Sawtimber	--	19,870	15,253	7,151	42,274
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	19,870	15,253	7,151	42,274
Aspen:					
Sawtimber	26,155	23,351	5,413	--	54,919
Poletimber	12,572	123,458	122,821	16,648	275,499
Sapling and seedling	--	20,469	12,572	--	33,041
Nonstocked	--	6,249	--	--	6,249
Total	38,727	173,527	140,806	16,648	369,708
Cottonwood:					
Sawtimber	--	23,989	--	--	23,989
Poletimber	--	6,031	--	--	6,031
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	30,020	--	--	30,020
All types:					
Sawtimber	42,073	178,260	108,995	14,310	343,638
Poletimber	20,760	152,938	172,827	16,648	363,173
Sapling and seedling	--	35,265	35,641	--	70,906
Nonstocked	--	6,249	20,599	--	26,848
Total	62,833	372,712	338,062	30,958	804,565

Table 10.--Area of State owned timberland by forest type, stand-size class, and productivity class in west-central Colorado, 1983

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - Acres - - - - - - - - - - - -				
Douglas-fir:					
Sawtimber	--	1,660	2,852	--	4,512
Poletimber	--	299	--	--	299
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	637	--	637
Total	--	1,959	3,489	--	5,448
Ponderosa pine:					
Sawtimber	--	--	339	--	339
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	988	--	988
Total	--	--	1,327	--	1,327
Lodgepole pine:					
Sawtimber	2,140	11,475	8,085	--	21,700
Poletimber	681	1,733	10,733	--	13,147
Sapling and seedling	--	--	4,331	--	4,331
Nonstocked	--	--	--	--	--
Total	2,821	13,208	23,149	--	39,178
Limber pine:					
Sawtimber	--	--	--	1,732	1,732
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	1,732	1,732
Spruce-subalpine fir:					
Sawtimber	--	3,732	2,818	--	6,550
Poletimber	--	1,019	2,141	--	3,160
Sapling and seedling	--	2,421	2,140	--	4,561
Nonstocked	--	--	--	--	--
Total	--	7,172	7,099	--	14,271

(con.)

Table 10. (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	Acres				
White fir:					
Sawtimber	2,191	--	--	--	2,191
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	2,191	--	--	--	2,191
Spruce:					
Sawtimber	--	3,037	2,778	2,140	7,955
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	3,037	2,778	2,140	7,955
Aspen:					
Sawtimber	4,177	2,080	598	--	6,855
Poletimber	2,331	12,090	14,968	1,784	31,173
Sapling and seedling	--	1,406	2,330	--	3,736
Nonstocked	--	494	--	--	494
Total	6,508	16,070	17,896	1,784	42,258
Cottonwood:					
Sawtimber	--	434	--	--	434
Poletimber	--	230	--	--	230
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	664	--	--	664
All types:					
Sawtimber	8,508	22,418	17,470	3,872	52,268
Poletimber	3,012	15,371	27,842	1,784	48,009
Sapling and seedling	--	3,827	8,801	--	12,628
Nonstocked	--	494	1,625	--	2,119
Total	11,520	42,110	55,738	5,656	115,024

Table 11.--Area of nonindustrial privately owned timberland by forest type, stand-size class, and productivity class in west-central Colorado, 1983

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - - - Acres - - - - - - - - - - - -				
Douglas-fir:					
Sawtimber	--	18,957	34,256	--	53,213
Poletimber	--	3,940	--	--	3,940
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	7,464	--	7,464
Total	--	22,897	41,720	--	64,617
Ponderosa pine:					
Sawtimber	--	--	3,523	--	3,523
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	11,510	--	11,510
Total	--	--	15,033	--	15,033
Lodgepole pine:					
Sawtimber	5,012	49,399	24,399	--	78,810
Poletimber	7,507	5,427	32,121	--	45,055
Sapling and seedling	--	--	11,586	--	11,586
Nonstocked	--	--	--	--	--
Total	12,519	54,826	68,106	--	135,451
Limber pine:					
Sawtimber	--	--	--	5,427	5,427
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	5,427	5,427
Spruce-subalpine fir:					
Sawtimber	--	25,827	12,057	--	37,884
Poletimber	--	11,031	5,011	--	16,042
Sapling and seedling	--	12,375	5,012	--	17,387
Nonstocked	--	--	--	--	--
Total	--	49,233	22,080	--	71,313

(con.)

Table 11. (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	Acres				
White fir:					
Sawtimber	6,575	--	--	--	6,575
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	6,575	--	--	--	6,575
Spruce:					
Sawtimber	--	16,833	12,475	5,011	34,319
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	16,833	12,475	5,011	34,319
Aspen:					
Sawtimber	21,978	21,271	4,815	--	48,064
Poletimber	10,241	111,368	107,853	14,864	244,326
Sapling and seedling	--	19,063	10,242	--	29,305
Nonstocked	--	5,755	--	--	5,755
Total	32,219	157,457	122,910	14,864	327,450
Cottonwood:					
Sawtimber	--	23,555	--	--	23,555
Poletimber	--	5,801	--	--	5,801
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	29,356	--	--	29,356
All types:					
Sawtimber	33,565	155,842	91,525	10,438	291,370
Poletimber	17,748	137,567	144,985	14,864	315,164
Sapling and seedling	--	31,438	26,840	--	58,278
Nonstocked	--	5,755	18,974	--	24,729
Total	51,313	330,602	282,324	25,302	689,541

Table 12.--Area of State and privately owned timberland by stand volume and ownership class in west-central Colorado, 1983

Stand volume per acre[1]	Ownership class		Total
	State	Nonindustrial private	
	Acres		
Less than 1,500 board feet	36,932	255,343	292,275
1,500 to 4,999 board feet	34,937	205,129	240,066
5,000 to 9,999 board feet	25,614	140,804	166,418
10,000 board feet or more	17,541	88,265	105,806
All classes	115,024	689,541	804,565

[1]International ¼-inch rule.

Table 13.--Area of State and privately owned timberland by forest type and area condition class in west-central Colorado, 1983

Forest type	Area condition class										
	10	20	30	40	50	60	70	80	90	Nonstocked	All classes
	Acres										
Douglas-fir	--	--	--	--	8,101	4,239	8,478	3,862	37,284	8,101	70,065
Ponderosa pine	--	--	--	--	--	--	3,862	--	--	12,498	16,360
Lodgepole pine	--	8,188	3,862	14,303	50,978	41,619	22,166	--	33,513	--	174,629
Limber pine	--	--	--	--	--	--	--	--	7,159	--	7,159
Spruce-subalpine fir	--	--	7,152	3,862	23,528	12,062	8,765	22,492	7,723	--	85,584
White fir	--	--	--	--	--	--	8,766	--	--	--	8,766
Spruce	--	--	--	--	4,239	--	16,580	7,151	14,304	--	42,274
Aspen	--	--	8,188	9,893	138,467	118,535	69,265	--	19,111	6,249	369,708
Cottonwood	--	--	--	--	--	6,031	--	--	23,989	--	30,020
All types	--	8,188	19,202	28,058	225,313	182,486	137,882	33,505	143,083	26,848	804,565

Table 14.--Number of growing-stock trees on State and privately owned timberland by species and diameter class in west-central Colorado, 1983

Species	Diameter class (inches at breast height)															
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand trees															
Douglas-fir	810	--	2,006	1,839	1,527	934	524	379	217	122	39	--	56	16	4	8,473
Ponderosa pine	625	--	--	--	--	34	--	26	18	23	--	--	--	--	--	726
Lodgepole pine	5,642	7,863	12,420	11,361	7,152	3,887	1,946	362	212	--	--	--	--	--	--	50,845
Limber pine	--	--	--	--	--	--	28	64	104	13	--	--	--	--	--	209
Subalpine fir	13,772	14,827	10,505	4,576	3,018	982	363	236	89	75	90	--	--	--	--	48,533
White fir	425	--	425	--	284	294	213	--	--	--	--	--	--	--	--	1,641
Engelmann spruce	7,768	7,975	6,490	4,172	2,183	1,912	1,160	288	262	217	47	24	51	30	11	32,590
Total softwoods	29,042	30,665	31,846	21,948	14,164	8,043	4,234	1,355	902	450	176	24	107	46	15	143,017
Aspen	32,772	30,871	40,693	25,763	15,423	5,150	1,762	572	269	45	49	--	--	--	--	153,369
Cottonwood	--	--	869	415	535	65	--	143	110	--	--	--	--	--	61	2,198
Total hardwoods	32,772	30,871	41,562	26,178	15,958	5,215	1,762	715	379	45	49	--	--	--	61	155,567
All species	61,814	61,536	73,408	48,126	30,122	13,258	5,996	2,070	1,281	495	225	24	107	46	76	298,584

Table 15.--Number of cull and salvable dead trees on State and privately owned timberland by ownership class, and softwoods and hardwoods in west-central Colorado, 1983

Ownership class and species group	Cull trees			Salvable dead trees	All dead trees
	Sound	Rotten	Total		
	- - - - - - - - - - Thousand trees - - - - - - - - - -				
State:					
Softwoods	--	27	27	1,759	1,786
Hardwoods	--	436	436	1,284	1,720
Total	--	463	463	3,043	3,506
Nonindustrial private:					
Softwoods	--	79	79	8,686	8,765
Hardwoods	--	2,991	2,991	9,781	12,772
Total	--	3,070	3,070	18,467	21,537
Total:					
Softwoods	--	106	106	10,445	10,551
Hardwoods	--	3,427	3,427	11,065	14,492
Total	--	3,533	3,533	21,510	25,043

Table 16.--Net volume of growing stock on State and privately owned timberland by ownership class, forest type, and stand-size class in west-central Colorado, 1983

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
		- - - - - - - - - - - - Thousand cubic feet - - - - - - - - - - - -				
State:						
	Douglas-fir	7,215	441	--	52	7,708
	Ponderosa pine	111	--	--	41	152
	Lodgepole pine	59,752	21,913	--	--	81,665
	Limber pine	725	--	--	--	725
	Spruce-subalpine fir	16,205	8,003	3,193	--	27,401
	White fir	2,399	--	--	--	2,399
	Spruce	20,164	--	--	--	20,164
	Aspen	19,294	43,252	977	--	63,523
	Cottonwood	189	306	--	--	495
	All types	126,054	73,915	4,170	93	204,232
Nonindustrial private:						
	Douglas-fir	83,747	5,813	--	576	90,136
	Ponderosa pine	1,158	--	--	479	1,637
	Lodgepole pine	211,716	93,330	--	--	305,046
	Limber pine	2,270	--	--	--	2,270
	Spruce-subalpine fir	102,236	63,690	10,041	--	175,967
	White fir	7,202	--	--	--	7,202
	Spruce	65,893	--	--	--	65,893
	Aspen	112,860	389,328	10,747	--	512,935
	Cottonwood	10,265	7,708	--	--	17,973
	All types	597,347	559,869	20,788	1,055	1,179,059
Total:						
	Douglas-fir	90,962	6,254	--	628	97,844
	Ponderosa pine	1,269	--	--	520	1,789
	Lodgepole pine	271,468	115,243	--	--	386,711
	Limber pine	2,995	--	--	--	2,995
	Spruce-subalpine fir	118,441	71,693	13,234	--	203,368
	White fir	9,601	--	--	--	9,601
	Spruce	86,057	--	--	--	86,057
	Aspen	132,154	432,580	11,724	--	576,458
	Cottonwood	10,454	8,014	--	--	18,468
	All types	723,401	633,784	24,958	1,148	1,383,291

Table 17.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class, forest type, and stand-size class in west-central Colorado, 1983

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
		- - - Thousand board feet, International ¼-inch rule - - -				
State:						
	Douglas-fir	29,049	1,210	--	198	30,457
	Ponderosa pine	442	--	--	201	643
	Lodgepole pine	188,116	28,071	--	--	216,187
	Limber pine	3,237	--	--	--	3,237
	Spruce-subalpine fir	60,564	14,874	9,344	--	84,782
	White fir	7,841	--	--	--	7,841
	Spruce	69,314	--	--	--	69,314
	Aspen	56,697	52,005	1,858	--	110,560
	Cottonwood	886	159	--	--	1,045
	All types	416,146	96,319	11,202	399	524,066
Nonindustrial private:						
	Douglas-fir	337,355	15,954	--	2,064	355,373
	Ponderosa pine	4,601	--	--	2,345	6,946
	Lodgepole pine	716,641	110,088	--	--	826,729
	Limber pine	10,137	--	--	--	10,137
	Spruce-subalpine fir	398,852	112,222	30,223	--	541,297
	White fir	23,533	--	--	--	23,533
	Spruce	217,909	--	--	--	217,909
	Aspen	362,673	444,505	19,108	--	826,286
	Cottonwood	48,035	4,003	--	--	52,038
	All types	2,119,736	686,772	49,331	4,409	2,860,248
Total:						
	Douglas-fir	366,404	17,164	--	2,262	385,830
	Ponderosa pine	5,043	--	--	2,546	7,589
	Lodgepole pine	904,757	138,159	--	--	1,042,916
	Limber pine	13,374	--	--	--	13,374
	Spruce-subalpine fir	459,416	127,096	39,567	--	626,079
	White fir	31,374	--	--	--	31,374
	Spruce	287,223	--	--	--	287,223
	Aspen	419,370	496,510	20,966	--	936,846
	Cottonwood	48,921	4,162	--	--	53,083
	All types	2,535,882	783,091	60,533	4,808	3,384,314

Table 18.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by ownership class, forest type, and stand-size class in west-central Colorado, 1983

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
		- - - - - - - Thousand board feet, Scribner rule - - - - - - -				
State:						
	Douglas-fir	24,590	1,049	--	165	25,804
	Ponderosa pine	367	--	--	174	541
	Lodgepole pine	160,434	24,076	--	--	184,510
	Limber pine	2,736	--	--	--	2,736
	Spruce-subalpine fir	50,693	12,568	7,936	--	71,197
	White fir	6,742	--	--	--	6,742
	Spruce	59,092	--	--	--	59,092
	Aspen	48,231	44,270	1,559	--	94,060
	Cottonwood	771	127	--	--	898
	All types	353,656	82,090	9,495	339	445,580
Nonindustrial private:						
	Douglas-fir	285,506	13,838	--	1,713	301,057
	Ponderosa pine	3,814	--	--	2,030	5,844
	Lodgepole pine	610,021	94,305	--	--	704,326
	Limber pine	8,569	--	--	--	8,569
	Spruce-subalpine fir	334,830	95,459	25,473	--	455,762
	White fir	20,237	--	--	--	20,237
	Spruce	185,525	--	--	--	185,525
	Aspen	308,953	378,501	16,042	--	703,496
	Cottonwood	41,783	3,211	--	--	44,994
	All types	1,799,238	585,314	41,515	3,743	2,429,810
Total:						
	Douglas-fir	310,096	14,887	--	1,878	326,861
	Ponderosa pine	4,181	--	--	2,204	6,385
	Lodgepole pine	770,455	118,381	--	--	888,836
	Limber pine	11,305	--	--	--	11,305
	Spruce-subalpine fir	385,523	108,027	33,409	--	526,959
	White fir	26,979	--	--	--	26,979
	Spruce	244,617	--	--	--	244,617
	Aspen	357,184	422,771	17,601	--	797,556
	Cottonwood	42,554	3,338	--	--	45,892
	All types	2,152,894	667,404	51,010	4,082	2,875,390

Table 19.--Net volume of growing stock on State and privately owned timberland by ownership class and species in west-central Colorado, 1983

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Douglas-fir	7,997	81,349	89,346
Ponderosa pine	167	2,037	2,204
Lodgepole pine	85,500	322,252	407,752
Limber pine	894	4,032	4,926
Subalpine fir	17,338	114,828	132,166
White fir	2,509	8,797	11,306
Engelmann spruce	32,463	147,114	179,577
Total softwoods	146,868	680,409	827,277
Aspen	56,869	480,677	537,546
Cottonwood	495	17,973	18,468
Total hardwoods	57,364	498,650	556,014
All species	204,232	1,179,059	1,383,291

Table 20.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class and species in west-central Colorado, 1983

Species	Ownership class		
	State	Nonindustrial private	Total
	- - Thousand board feet, International ¼-inch rule - -		
Douglas-fir	32,279	339,189	371,468
Ponderosa pine	816	9,987	10,803
Lodgepole pine	238,773	927,507	1,166,280
Limber pine	4,072	18,834	22,906
Subalpine fir	46,544	295,458	342,002
White fir	9,466	34,698	44,164
Engelmann spruce	113,500	557,427	670,927
Total softwoods	445,450	2,183,100	2,628,550
Aspen	77,571	625,110	702,681
Cottonwood	1,045	52,038	53,083
Total hardwoods	78,616	677,148	755,764
All species	524,066	2,860,248	3,384,314

Table 21.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by ownership class and species in west-central Colorado, 1983

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - Thousand board feet, Scribner rule - - - - -		
Douglas-fir	27,315	287,215	314,530
Ponderosa pine	703	8,626	9,329
Lodgepole pine	203,612	790,021	993,633
Limber pine	3,440	15,894	19,334
Subalpine fir	39,488	250,403	289,891
White fir	8,135	29,572	37,707
Engelmann spruce	96,011	471,376	567,387
Total softwoods	378,704	1,853,107	2,231,811
Aspen	65,978	531,709	597,687
Cottonwood	898	44,994	45,892
Total hardwoods	66,876	576,703	643,579
All species	445,580	2,429,810	2,875,390

Table 22.--Net volume of growing stock on State and privately owned timberland by species and diameter class in west-central Colorado, 1983

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand cubic feet													
Douglas-fir	3,663	7,955	15,184	13,427	12,468	12,552	7,688	6,741	2,593	--	4,633	1,692	750	89,346
Ponderosa pine	--	--	--	438	--	554	692	520	--	--	--	--	--	2,204
Lodgepole pine	43,183	95,345	105,168	84,181	56,818	13,358	9,699	--	--	--	--	--	--	407,752
Limber pine	--	--	--	--	675	1,436	2,292	523	--	--	--	--	--	4,926
Subalpine fir	27,236	24,949	32,947	18,569	8,052	8,150	3,614	3,542	5,107	--	--	--	--	132,166
White fir	659	--	2,462	3,510	4,675	--	--	--	--	--	--	--	--	11,306
Engelmann spruce	14,583	23,957	22,164	34,011	30,136	11,600	13,199	12,843	4,310	1,998	5,126	4,020	1,630	179,577
Total softwoods	89,324	152,206	177,925	154,136	112,824	47,650	37,184	24,169	12,010	1,998	9,759	5,712	2,380	827,277
Aspen	89,275	146,766	156,919	77,496	38,751	15,181	9,118	1,360	2,680	--	--	--	--	537,546
Cottonwood	874	1,946	4,376	818	--	2,543	2,279	--	--	--	--	--	5,632	18,468
Total hardwoods	90,149	148,712	161,295	78,314	38,751	17,724	11,397	1,360	2,680	--	--	--	5,632	556,014
All species	179,473	300,918	339,220	232,450	151,575	65,374	48,581	25,529	14,690	1,998	9,759	5,712	8,012	1,383,291

Table 23.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by species and diameter class in west-central Colorado, 1983

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	52,252	60,219	62,294	65,262	40,104	36,504	14,313	--	26,249	9,797	4,474	371,468
Ponderosa pine	--	1,889	--	2,717	3,651	2,546	--	--	--	--	--	10,803
Lodgepole pine	365,715	393,209	287,809	69,272	50,275	--	--	--	--	--	--	1,166,280
Limber pine	--	--	3,209	6,538	10,519	2,640	--	--	--	--	--	22,906
Subalpine fir	114,623	87,320	38,296	40,207	17,859	17,588	26,109	--	--	--	--	342,002
White fir	7,260	14,597	22,307	--	--	--	--	--	--	--	--	44,164
Engelmann spruce	79,285	157,995	147,769	58,683	66,800	65,618	23,272	10,724	28,382	22,930	9,469	670,927
Total softwoods	619,135	715,229	561,684	242,679	189,208	124,896	63,694	10,724	54,631	32,727	13,943	2,628,550
Aspen	XXXXX	366,025	193,586	76,951	46,145	6,622	13,352	--	--	--	--	702,681
Cottonwood	XXXXX	4,162	--	12,474	10,819	--	--	--	--	--	25,628	53,083
Total hardwoods	XXXXX	370,187	193,586	89,425	56,964	6,622	13,352	--	--	--	25,628	755,764
All species	619,135	1,085,416	755,270	332,104	246,172	131,518	77,046	10,724	54,631	32,727	39,571	3,384,314

Table 24.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by species and diameter class in west-central Colorado, 1983

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Douglas-fir	46,271	51,983	51,632	53,236	32,624	30,387	12,447	--	23,250	8,719	3,981	314,530
Ponderosa pine	--	1,574	--	2,343	3,208	2,204	--	--	--	--	--	9,329
Lodgepole pine	318,499	332,475	241,475	58,296	42,888	--	--	--	--	--	--	993,633
Limber pine	--	--	2,707	5,523	8,878	2,226	--	--	--	--	--	19,334
Subalpine fir	100,599	73,375	31,803	32,692	14,436	14,645	22,341	--	--	--	--	289,891
White fir	6,462	12,702	18,543	--	--	--	--	--	--	--	--	37,707
Engelmann spruce	69,059	133,463	121,797	47,533	55,109	56,074	20,712	9,545	25,259	20,408	8,428	567,387
Total softwoods	540,890	605,572	467,957	199,623	157,143	105,536	55,500	9,545	48,509	29,127	12,409	2,231,811
Aspen	XXXXX	314,341	162,361	64,806	39,152	5,610	11,417	--	--	--	--	597,687
Cottonwood	XXXXX	3,338	--	10,499	9,246	--	--	--	--	--	22,809	45,892
Total hardwoods	XXXXX	317,679	162,361	75,305	48,398	5,610	11,417	--	--	--	22,809	643,579
All species	540,890	923,251	630,318	274,928	205,541	111,146	66,917	9,545	48,509	29,127	35,218	2,875,390

Table 25.--Net volume of timber on State and privately owned timberland by class of timber, and softwoods and hardwoods in west-central Colorado, 1983

Class of timber	Softwoods	Hardwoods	All classes
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Sawtimber trees:			
Saw-log portion	519,947	116,186	636,133
Upper-stem portion	65,800	39,672	105,472
Total	585,747	155,858	741,605
Poletimber trees	241,530	400,156	641,686
All growing stock trees	827,277	556,014	1,383,291
Sound cull trees	--	--	--
Rotten cull trees	1,286	4,976	6,262
Salvable dead trees	66,700	33,103	99,803
All timber	895,263	594,093	1,489,356

Table 26.--Net volume of growing stock on State and privately owned timberland by forest type and species in west-central Colorado, 1983

Forest type	Species											
	Douglas-fir	Ponderosa pine	Lodgepole pine	Limber pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	Cotton-wood	Total hardwoods	All species
	- Thousand cubic feet -											
Douglas-fir	75,508	1,246	--	1,931	9,934	--	4,438	93,057	4,787	--	4,787	97,844
Ponderosa pine	628	958	--	--	--	--	--	1,586	203	--	203	1,789
Lodgepole pine	--	--	367,442	--	3,869	929	2,727	374,967	11,744	--	11,744	386,711
Limber pine	--	--	--	2,995	--	--	--	2,995	--	--	--	2,995
Spruce-subalpine fir	8,665	--	18,148	--	88,184	--	84,635	199,632	3,736	--	3,736	203,368
White fir	649	--	477	--	--	8,475	--	9,601	--	--	--	9,601
Spruce	613	--	7,471	--	--	--	73,362	81,446	4,611	--	4,611	86,057
Aspen	3,283	--	14,214	--	30,179	1,902	14,415	63,993	512,465	--	512,465	576,458
Cottonwood	--	--	--	--	--	--	--	--	--	18,468	18,468	18,468
All types	89,346	2,204	407,752	4,926	132,166	11,306	179,577	827,277	537,546	18,468	556,014	1,383,291

Table 27.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by forest type and species in west-central Colorado, 1983

Forest type	Species											
	Douglas-fir	Ponderosa pine	Lodgepole pine	Limber pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	Cotton-wood	Total hardwoods	All species
	Thousand board feet, International ¼-inch rule											
Douglas-fir	334,973	6,368	--	9,532	20,422	--	14,535	385,830	--	--	--	385,830
Ponderosa pine	3,154	4,435	--	--	--	--	--	7,589	--	--	--	7,589
Lodgepole pine	--	--	1,022,088	--	4,255	3,369	13,204	1,042,916	--	--	--	1,042,916
Limber pine	--	--	--	13,374	--	--	--	13,374	--	--	--	13,374
Spruce-subalpine fir	23,134	--	70,817	--	206,196	--	325,932	626,079	--	--	--	626,079
White fir	--	--	--	--	--	31,374	--	31,374	--	--	--	31,374
Spruce	3,103	--	33,776	--	--	--	250,344	287,223	--	--	--	287,223
Aspen	7,104	--	39,599	--	111,129	9,421	66,912	234,165	702,681	--	702,681	936,846
Cottonwood	--	--	--	--	--	--	--	--	--	53,083	53,083	53,083
All types	371,468	10,803	1,166,280	22,906	342,002	44,164	670,927	2,628,550	702,681	53,083	755,764	3,384,314

Table 28.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by forest type and species in west-central Colorado, 1983

Forest type	Species											
	Douglas-fir	Ponderosa pine	Lodgepole pine	Limber pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	Cotton-wood	Total hardwoods	All species
	Thousand board feet, Scribner rule											
Douglas-fir	283,401	5,551	--	8,029	17,522	--	12,358	326,861	--	--	--	326,861
Ponderosa pine	2,607	3,778	--	--	--	--	--	6,385	--	--	--	6,385
Lodgepole pine	--	--	871,078	--	3,788	2,999	10,971	888,836	--	--	--	888,836
Limber pine	--	--	--	11,305	--	--	--	11,305	--	--	--	11,305
Spruce-subalpine fir	19,681	--	60,316	--	174,004	--	272,958	526,959	--	--	--	526,959
White fir	--	--	--	--	--	26,979	--	26,979	--	--	--	26,979
Spruce	2,556	--	28,667	--	--	--	213,394	244,617	--	--	--	244,617
Aspen	6,285	--	33,572	--	94,577	7,729	57,706	199,869	597,687	--	597,687	797,556
Cottonwood	--	--	--	--	--	--	--	--	--	45,892	45,892	45,892
All types	314,530	9,329	993,633	19,334	289,891	37,707	567,387	2,231,811	597,687	45,892	643,579	2,875,390

Table 29.--Net annual growth of growing stock on State and privately owned timberland by ownership class and species in west-central Colorado, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Douglas-fir	194	1,768	1,962
Ponderosa pine	1	16	17
Lodgepole pine	1,599	5,418	7,017
Limber pine	9	39	48
Subalpine fir	297	1,671	1,968
White fir	40	136	176
Engelmann spruce	469	2,512	2,981
Total softwoods	2,609	11,560	14,169
Aspen	1,306	11,410	12,716
Cottonwood	17	522	539
Total hardwoods	1,323	11,932	13,255
All species	3,932	23,492	27,424

Table 30.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class and species in west-central Colorado, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - Thousand board feet, International ¼-inch rule - -		
Douglas-fir	855	8,803	9,658
Ponderosa pine	7	88	95
Lodgepole pine	4,793	11,670	16,463
Limber pine	53	231	284
Subalpine fir	3,467	14,249	17,716
White fir	1,063	3,274	4,337
Engelmann spruce	1,827	10,096	11,923
Total softwoods	12,065	48,411	60,476
Aspen	5,307	36,722	42,029
Cottonwood	16	742	758
Total hardwoods	5,323	37,464	42,787
All species	17,388	85,875	103,263

Table 31.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland by ownership class and species in west-central Colorado, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - Thousand board feet, Scribner rule - - - - -		
Douglas-fir	723	7,429	8,152
Ponderosa pine	6	79	85
Lodgepole pine	4,202	10,275	14,477
Limber pine	44	193	237
Subalpine fir	3,042	12,506	15,548
White fir	927	2,847	3,774
Engelmann spruce	1,396	7,973	9,369
Total softwoods	10,340	41,302	51,642
Aspen	4,564	31,585	36,149
Cottonwood	14	675	689
Total hardwoods	4,578	32,260	36,838
All species	14,918	73,562	88,480

Table 32.--Net annual growth of growing stock on State and privately owned timberland by species and diameter class in west-central Colorado, 1982

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand cubic feet													
Douglas-fir	500	238	385	311	175	166	77	58	10	--	36	4	2	1,962
Ponderosa pine	--	--	--	3	--	8	2	4	--	--	--	--	--	17
Lodgepole pine	2,824	2,010	1,925	22	501	146	-411	--	--	--	--	--	--	7,017
Limber pine	--	--	--	--	6	21	19	2	--	--	--	--	--	48
Subalpine fir	783	409	713	376	-508	51	62	32	50	--	--	--	--	1,968
White fir	54	--	-79	101	100	--	--	--	--	--	--	--	--	176
Engelmann spruce	494	492	371	649	531	165	103	63	15	17	53	25	3	2,981
Total softwoods	4,655	3,149	3,315	1,462	805	557	-148	159	75	17	89	29	5	14,169
Aspen	4,615	3,938	2,855	1,005	154	47	80	5	17	--	--	--	--	12,716
Cottonwood	197	41	139	19	--	35	31	--	--	--	--	--	77	539
Total hardwoods	4,812	3,979	2,994	1,024	154	82	111	5	17	--	--	--	77	13,255
All species	9,467	7,128	6,309	2,486	959	639	-37	164	92	17	89	29	82	27,424

Table 33.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland by species and diameter class in west-central Colorado, 1982

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Douglas-fir	4,785	1,816	1,006	942	438	348	65	--	224	24	10	9,658
Ponderosa pine	--	15	--	47	13	20	--	--	--	--	--	95
Lodgepole pine	13,150	1,568	3,082	793	-2,130	--	--	--	--	--	--	16,463
Limber pine	--	--	39	125	107	13	--	--	--	--	--	284
Subalpine fir	17,115	2,076	-2,501	259	321	153	293	--	--	--	--	17,716
White fir	3,251	564	522	--	--	--	--	--	--	--	--	4,337
Engelmann spruce	3,000	3,615	2,853	861	546	333	91	108	335	160	21	11,923
Total softwoods	41,301	9,654	5,001	3,027	-705	867	449	108	559	184	31	60,476
Aspen	XXXXX	40,249	990	292	396	25	77	--	--	--	--	42,029
Cottonwood	XXXXX	99	--	159	128	--	--	--	--	--	372	758
Total hardwoods	XXXXX	40,348	990	451	524	25	77	--	--	--	372	42,787
All species	41,301	50,002	5,991	3,478	-181	892	526	108	559	184	403	103,263

Table 34.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland by species and diameter class in west-central Colorado, 1982

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Douglas-fir	4,221	1,454	791	741	344	304	64	--	202	22	9	8,152
Ponderosa pine	--	14	--	42	11	18	--	--	--	--	--	85
Lodgepole pine	11,629	1,271	2,617	729	-1,769	--	--	--	--	--	--	14,477
Limber pine	--	--	32	104	89	12	--	--	--	--	--	237
Subalpine fir	15,119	1,640	-2,063	203	252	141	256	--	--	--	--	15,548
White fir	2,893	472	409	--	--	--	--	--	--	--	--	3,774
Engelmann spruce	2,182	2,860	2,241	676	460	314	81	96	299	142	18	9,369
Total softwoods	36,044	7,711	4,027	2,495	-613	789	401	96	501	164	27	51,642
Aspen	XXXXX	34,552	895	269	345	22	66	--	--	--	--	36,149
Cottonwood	XXXXX	91	--	148	118	--	--	--	--	--	332	689
Total hardwoods	XXXXX	34,643	895	417	463	22	66	--	--	--	332	36,838
All species	36,044	42,354	4,922	2,912	-150	811	467	96	501	164	359	88,480

Table 35.--Annual mortality of growing stock on State and privately owned timberland by ownership class and species in west-central Colorado, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Lodgepole pine	205	1,290	1,495
Subalpine fir	109	602	711
White fir	41	124	165
Engelmann spruce	5	63	68
Total softwoods	360	2,079	2,439
Aspen	243	2,346	2,589
Total hardwoods	243	2,346	2,589
All species	603	4,425	5,028

Table 36.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class and species in west-central Colorado, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- Thousand board feet, International ¼-inch rule -		
Lodgepole pine	759	5,826	6,585
Subalpine fir	498	2,581	3,079
White fir	122	364	486
Total softwoods	1,379	8,771	10,150
Aspen	248	2,910	3,158
Total hardwoods	248	2,910	3,158
All species	1,627	11,681	13,308

Table 37.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by ownership class and species in west-central Colorado, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
	- - - - - Thousand board feet, Scribner rule - - - - -		
Lodgepole pine	646	4,949	5,595
Subalpine fir	407	2,109	2,516
White fir	108	324	432
Total softwoods	1,161	7,382	8,543
Aspen	211	2,473	2,684
Total hardwoods	211	2,473	2,684
All species	1,372	9,855	11,227

Table 38.--Annual mortality of growing stock on State and privately owned timberland by species and diameter class in west-central Colorado, 1982

Species	Diameter class (inches at breast height)													
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	- Thousand cubic feet -													
Lodgepole pine	--	134	--	854	--	--	507	--	--	--	--	--	--	1,495
Subalpine fir	--	94	--	--	617	--	--	--	--	--	--	--	--	711
White fir	--	--	165	--	--	--	--	--	--	--	--	--	--	165
Engelmann spruce	68	--	--	--	--	--	--	--	--	--	--	--	--	68
Total softwoods	68	228	165	854	617	--	507	--	--	--	--	--	--	2,439
Aspen	1,032	364	549	264	290	90	--	--	--	--	--	--	--	2,589
Total hardwoods	1,032	364	549	264	290	90	--	--	--	--	--	--	--	2,589
All species	1,100	592	714	1,118	907	90	507	--	--	--	--	--	--	5,028

Table 39.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by species and diameter class in west-central Colorado, 1982

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule											
Lodgepole pine	--	3,956	--	--	2,629	--	--	--	--	--	--	6,585
Subalpine fir	--	--	3,079	--	--	--	--	--	--	--	--	3,079
White fir	486	--	--	--	--	--	--	--	--	--	--	486
Total softwoods	486	3,956	3,079	--	2,629	--	--	--	--	--	--	10,150
Aspen	XXXXX	1,188	1,532	438	--	--	--	--	--	--	--	3,158
Total hardwoods	XXXXX	1,188	1,532	438	--	--	--	--	--	--	--	3,158
All species	486	5,144	4,611	438	2,629	--	--	--	--	--	--	13,308

Table 40.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by species and diameter class in west-central Colorado, 1982

Species	Diameter class (inches at breast height)											
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	All classes
	Thousand board feet, Scribner rule											
Lodgepole pine	--	3,350	--	--	2,245	--	--	--	--	--	--	5,595
Subalpine fir	--	--	2,516	--	--	--	--	--	--	--	--	2,516
White fir	432	--	--	--	--	--	--	--	--	--	--	432
Total softwoods	432	3,350	2,516	--	2,245	--	--	--	--	--	--	8,543
Aspen	XXXXX	1,025	1,292	367	--	--	--	--	--	--	--	2,684
Total hardwoods	XXXXX	1,025	1,292	367	--	--	--	--	--	--	--	2,684
All species	432	4,375	3,808	367	2,245	--	--	--	--	--	--	11,227

Table 41.--Annual mortality of growing stock on State and privately owned timberland by cause of death and species in west-central Colorado, 1982

Species	Cause of death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown[1]	Total
	Thousand cubic feet								
Lodgepole pine	--	486	--	209	348	--	--	452	1,495
Subalpine fir	295	322	--	--	--	94	--	--	711
White fir	165	--	--	--	--	--	--	--	165
Engelmann spruce	--	--	--	--	--	--	--	68	68
Total softwoods	460	808	--	209	348	94	--	520	2,439
Aspen	--	1,078	76	--	111	--	--	1,324	2,589
Total hardwoods	--	1,078	76	--	111	--	--	1,324	2,589
All species	460	1,886	76	209	459	94	--	1,844	5,028

[1]Because many destructive agents often attack trees in concert or in succession, it is often difficult to identify the actual causal agent. When the primary cause of death cannot be precisely determined, it is listed as unknown.

Table 42.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by cause of death and species in west-central Colorado, 1982

Species	Cause of death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown[1]	Total
	Thousand board feet, International ¼-inch rule								
Lodgepole pine	--	1,602	--	843	1,808	--	--	2,332	6,585
Subalpine fir	1,456	1,623	--	--	--	--	--	--	3,079
White fir	486	--	--	--	--	--	--	--	486
Total softwoods	1,942	3,225	--	843	1,808	--	--	2,332	10,150
Aspen	--	--	--	--	438	--	--	2,720	3,158
Total hardwoods	--	--	--	--	438	--	--	2,720	3,158
All species	1,942	3,225	--	843	2,246	--	--	5,052	13,308

[1]Because many destructive agents often attack trees in concert or in succession, it is often difficult to identify the actual causal agent. When the primary cause of death cannot be precisely determined, it is listed as unknown.

Table 43.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by cause of death and species in west-central Colorado, 1982

Species	Cause of death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown[1]	Total
	Thousand board feet, Scribner rule								
Lodgepole pine	--	1,370	--	722	1,543	--	--	1,960	5,595
Subalpine fir	1,191	1,325	--	--	--	--	--	--	2,516
White fir	432	--	--	--	--	--	--	--	432
Total softwoods	1,623	2,695	--	722	1,543	--	--	1,960	8,543
Aspen	--	--	--	--	368	--	--	2,316	2,684
Total hardwoods	--	--	--	--	368	--	--	2,316	2,684
All species	1,623	2,695	--	722	1,911	--	--	4,276	11,227

[1]Because many destructive agents often attack trees in concert or in succession, it is often difficult to identify the actual causal agent. When the primary cause of death cannot be precisely determined, it is listed as unknown.

Table 44.--Area of State and privately owned woodland by ownership class and forest type in west-central Colorado, 1983

Forest type	Ownership class		
	State	Nonindustrial private	Total
	Acres		
Pinyon-juniper	8,833	47,288	56,121
Juniper	1,016	10,569	11,585
Total woodland softwoods	9,849	57,857	67,706
Oak	15,468	133,413	148,881
Total woodland hardwoods	15,468	133,413	148,881
All types	25,317	191,270	216,587

Table 45.--Net volume of State and privately owned woodland by ownership class and species in west-central Colorado, 1983

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - Thousand cubic feet - - - - - - -		
Aspen	181	4,431	4,612
Pinyon/juniper	5,959	31,017	36,976
Woodland hardwoods	4,395	34,313	38,708
All species	10,535	69,761	80,296

Table 46.--Net annual growth of State and privately owned woodland by ownership class and species in west-central Colorado, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - Thousand cubic feet - - - - - - -		
Aspen	5	120	125
Pinyon/juniper	41	224	265
Woodland hardwoods	143	1,168	1,311
All species	189	1,512	1,701

Table 47.--Annual mortality of State and privately owned woodland by ownership class and species in west-central Colorado, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
	- - - - - - - Thousand cubic feet - - - - - - -		
Aspen	([1])	8	8
Woodland hardwoods	1	8	9
All species	1	16	17

[1]Less than 500 cubic feet.

Table 48.--Area of State and privately owned timberland by county and ownership class in west-central Colorado, 1983

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - - - - - - Acres - - - - - - - - - - - - - -		
Alamosa	153	6,387	6,540
Conejos	12,133	18,590	30,723
Eagle	2,336	51,916	54,252
Grand	15,816	98,831	114,647
Gunnison	3,777	115,002	118,779
Hinsdale	708	13,099	13,807
Jackson	62,899	58,386	121,285
Mineral	423	13,164	13,587
Pitkin	56	27,197	27,253
Rio Grande	199	15,045	15,244
Routt	13,481	186,552	200,033
Saguache	2,886	45,036	47,922
San Juan	153	7,339	7,492
Summit	4	32,997	33,001
Total	115,024	689,541	804,565

Table 49.--Net volume of growing stock on State and privately owned timberland by county and ownership class in west-central Colorado, 1983

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Alamosa	206	3,798	4,004
Conejos	26,815	28,257	55,072
Eagle	3,902	100,289	104,191
Grand	25,665	168,921	194,586
Gunnison	7,066	223,082	230,148
Hinsdale	1,526	26,129	27,655
Jackson	113,645	98,086	211,731
Mineral	1,053	27,755	28,808
Pitkin	17	54,053	54,070
Rio Grande	186	22,954	23,140
Routt	19,437	284,111	303,548
Saguache	4,353	68,265	72,618
San Juan	359	16,146	16,505
Summit	2	57,213	57,215
Total	204,232	1,179,059	1,383,291

Table 50.--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by county and ownership class in west-central Colorado, 1983

County	Ownership class		
	State	Nonindustrial private	Total
	- - Thousand board feet, International ¼-inch rule - -		
Alamosa	588	10,344	10,932
Conejos	68,654	84,400	153,054
Eagle	8,533	232,261	240,794
Grand	59,924	441,056	500,980
Gunnison	19,160	532,238	551,398
Hinsdale	4,628	79,240	83,868
Jackson	303,201	226,357	529,558
Mineral	3,200	76,210	79,410
Pitkin	2	124,623	124,625
Rio Grande	596	67,728	68,324
Routt	42,135	606,738	648,873
Saguache	12,867	184,410	197,277
San Juan	574	47,515	48,089
Summit	4	147,128	147,132
Total	524,066	2,860,248	3,384,314

Table 51.--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by county and ownership class in west-central Colorado, 1983

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - Thousand board feet, Scribner rule - - - - -		
Alamosa	500	8,867	9,367
Conejos	58,216	71,784	130,000
Eagle	7,252	196,777	204,029
Grand	50,969	375,377	426,346
Gunnison	16,215	451,044	467,259
Hinsdale	3,915	67,138	71,053
Jackson	258,071	192,643	450,714
Mineral	2,708	64,587	67,295
Pitkin	2	105,789	105,791
Rio Grande	506	57,553	58,059
Routt	35,835	516,420	552,255
Saguache	10,899	156,332	167,231
San Juan	489	40,282	40,771
Summit	3	125,217	125,220
Total	445,580	2,429,810	2,875,390

Table 52.--Net annual growth of growing stock on State and privately owned timberland by county and ownership class in west-central Colorado, 1982

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Alamosa	2	63	65
Conejos	451	417	868
Eagle	76	1,936	2,012
Grand	574	3,335	3,909
Gunnison	132	4,282	4,414
Hinsdale	24	421	445
Jackson	2,110	2,070	4,180
Mineral	15	464	479
Pitkin	(1)	978	978
Rio Grande	4	354	358
Routt	451	6,499	6,950
Saguache	86	1,314	1,400
San Juan	7	244	251
Summit	(1)	1,115	1,115
Total	3,932	23,492	27,424

[1]Less than 500 cubic feet.

Table 53.--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland by county and ownership class in west-central Colorado, 1982

County	Ownership class		
	State	Nonindustrial private	Total
	- - Thousand board feet, International ¼-inch rule - -		
Alamosa	7	143	150
Conejos	1,556	1,348	2,904
Eagle	293	5,293	5,586
Grand	2,111	15,422	17,533
Gunnison	412	13,541	13,953
Hinsdale	82	1,471	1,553
Jackson	10,774	7,804	18,578
Mineral	50	1,406	1,456
Pitkin	(1)	3,632	3,632
Rio Grande	16	1,101	1,117
Routt	1,732	23,040	24,772
Saguache	320	4,192	4,512
San Juan	35	864	899
Summit	(1)	6,618	6,618
Total	17,388	85,875	103,263

[1]Less than 500 board feet.

Table 54.--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland by county and ownership class in west-central Colorado, 1982

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - Thousand board feet, Scribner rule - - - - -		
Alamosa	6	126	132
Conejos	1,322	1,148	2,470
Eagle	250	4,512	4,762
Grand	1,814	13,256	15,070
Gunnison	352	11,538	11,890
Hinsdale	70	1,243	1,313
Jackson	9,256	6,705	15,961
Mineral	42	1,185	1,227
Pitkin	([1])	3,095	3,095
Rio Grande	14	941	955
Routt	1,492	19,799	21,291
Saguache	271	3,573	3,844
San Juan	29	726	755
Summit	([1])	5,715	5,715
Total	14,918	73,562	88,480

[1]Less than 500 board feet.

Table 55.--Annual mortality of growing stock on State and privately owned timberland by county and ownership class in west-central Colorado, 1982

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - Thousand cubic feet - - - - - - - -		
Alamosa	1	33	34
Conejos	125	117	242
Eagle	22	614	636
Grand	54	401	455
Gunnison	40	1,272	1,312
Hinsdale	8	105	113
Jackson	281	222	503
Mineral	5	122	127
Pitkin	([1])	281	281
Rio Grande	1	107	108
Routt	44	587	631
Saguache	20	388	408
San Juan	2	56	58
Summit	([1])	120	120
Total	603	4,425	5,028

[1]Less than 500 cubic feet.

Table 56.--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by county and ownership class in west-central Colorado, 1982

County	Ownership class		
	State	Nonindustrial private	Total
	- - Thousand board feet, International ¼-inch rule - -		
Alamosa	3	47	50
Conejos	387	405	792
Eagle	41	1,836	1,877
Grand	125	1,106	1,231
Gunnison	109	3,443	3,552
Hinsdale	23	342	365
Jackson	805	459	1,264
Mineral	17	442	459
Pitkin	--	679	679
Rio Grande	--	345	345
Routt	76	1,097	1,173
Saguache	38	932	970
San Juan	3	214	217
Summit	--	334	334
Total	1,627	11,681	13,308

Table 57.--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by county and ownership class in west-central Colorado, 1982

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - Thousand board feet, Scribner rule - - - - - -		
Alamosa	2	39	41
Conejos	327	342	669
Eagle	35	1,543	1,578
Grand	106	930	1,036
Gunnison	92	2,903	2,995
Hinsdale	19	290	309
Jackson	677	386	1,063
Mineral	14	372	386
Pitkin	--	575	575
Rio Grande	--	291	291
Routt	65	933	998
Saguache	33	786	819
San Juan	2	181	183
Summit	--	284	284
Total	1,372	9,855	11,227

Table 58.--Area of State and privately owned woodland by county and ownership class in west-central Colorado, 1983

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - - - - - Acres - - - - - - - - - - - - -		
Alamosa	200	3,257	3,457
Conejos	2,994	2,983	5,977
Eagle	4,715	28,418	33,133
Grand	2,391	5,129	7,520
Gunnison	596	34,480	35,076
Hinsdale	110	1,476	1,586
Jackson	1,534	4,724	6,258
Mineral	46	822	868
Pitkin	375	18,398	18,773
Rio Grande	817	7,556	8,373
Routt	9,604	57,268	66,872
Saguache	1,888	23,820	25,708
San Juan	45	942	987
Summit	2	1,997	1,999
Total	25,317	191,270	216,587

Table 59.--Net volume of State and privately owned woodland by county and ownership class in west-central Colorado, 1983

County	Ownership class		
	State	Nonindustrial private	Total
	- - - - - - - - - Thousand cubic feet - - - - - - - - -		
Alamosa	110	1,319	1,429
Conejos	1,210	1,062	2,272
Eagle	2,155	12,631	14,786
Grand	1,401	2,352	3,753
Gunnison	138	7,286	7,424
Hinsdale	26	316	342
Jackson	923	1,311	2,234
Mineral	11	219	230
Pitkin	72	3,376	3,448
Rio Grande	545	4,243	4,788
Routt	2,859	22,332	25,191
Saguache	1,083	12,211	13,294
San Juan	2	158	160
Summit	([1])	945	945
Total	10,535	69,761	80,296

[1]Less than 500 cubic feet.

Table 60.--Net annual growth of State and privately owned woodland by county and ownership class in west-central Colorado, 1982

County	Ownership class		
	State	Nonindustrial private	Total
	Thousand cubic feet		
Alamosa	1	11	12
Conejos	18	14	32
Eagle	32	205	237
Grand	15	37	52
Gunnison	4	309	313
Hinsdale	1	11	12
Jackson	12	35	47
Mineral	(1)	8	8
Pitkin	4	175	179
Rio Grande	4	35	39
Routt	90	527	617
Saguache	8	119	127
San Juan	(1)	9	9
Summit	(1)	17	17
Total	189	1,512	1,701

[1]Less than 500 cubic feet.

Table 61.--Annual mortality of State and privately owned woodland by county and ownership class in west-central Colorado, 1982

County	Ownership class		
	State	Nonindustrial private	Total
	Thousand cubic feet		
Alamosa	--	(1)	(1)
Conejos	(1)	(1)	(1)
Eagle	(1)	3	3
Grand	(1)	(1)	(1)
Gunnison	(1)	5	5
Hinsdale	--	(1)	(1)
Jackson	--	(1)	(1)
Mineral	--	1	1
Pitkin	(1)	2	2
Rio Grande	--	(1)	(1)
Routt	1	4	5
Saguache	--	1	1
San Juan	--	(1)	(1)
Summit	--	(1)	(1)
Total	1	16	17

[1]Less than 500 cubic feet.

Conner, Roger C.; Brown, Susan S. 1987. West-central Colorado: forest statistics for State and private land, 1983. Resour. Bull. INT-44. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 47 p.

Presents land area, timberland area, woodland area, timber inventory, and growth and mortality data for 14 counties in west-central Colorado. Information and statistical tables are based on Forest Survey data collected from 1982 and 1983 and cover State and private resources.

KEYWORDS: timberland, woodland, growing-stock volume, net annual growth, roundwood harvest, fuelwood harvest

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